

# COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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## 70/158s Sold at Auction For \$1 Million

Special to CW

ELK GROVE VILLAGE, Ill. — Two IBM 370/158s sold for a total of \$1.027 million at an auction here last week. Originally configured as a multiprocessor unit, the systems reportedly were worth nearly \$4 million three years ago.

The current IBM list price is about \$1.5 million for each processor.

One unit was purchased for \$490,000 by Jeffrey Klein, senior marketing manager for IPS Computer Marketing Corp. in Paramus, N.J. Klein purchased the unit to resell to a client, he said, adding that the price was about what dealers expected to pay for the processor.

The second CPU went to Ronald Baker, vice-president of CMI, Inc. of Troy, Mich. Baker paid \$510,000 for it and also purchased a Model 3058 connecting device — which IBM currently lists at \$46,000 — for \$27,000.

About 30 people, mostly dealers and lessors, attended the auction held in a conference room at the Holiday Inn here.

The room's doors were open so the bidders could see the packaged computer hardware stored on two trucks. "When they said immediate delivery, they meant it," one lessor quipped.

The original multiprocessor system was leased to Ohio Bell Telephone through arrangements made with ITEL Corp. Although the system's owner was not disclosed, most lessors attend-

(Continued on Page 6)

## SNA Seen Basis Of IBM's DDP

By Brad Schultz

CW Staff

DELRAN, N.J. — Ending years of token interest in data communications, IBM began in 1975 to endow every programmable product released since then with some sort of communications capability.

CW Special Report on "The Move to Distributed Processing" follows Page 54.

According to a recent Datapro Research Corp. report, IBM's System Network Architecture (SNA) plays a crucial role in this aggressive strategy. Coined as a term in 1973, SNA "has become the umbrella under which IBM has subsequently developed its approach to distributed systems."

In considering the next several years, Datapro expects SNA to support IBM's 3730 "Distributed Office Com-

(Continued on Page 8)

## Utility Threatens to Cut Power California Sites: 80° or Else . . .

By Jeffrey Beeler

CW West Coast Bureau

SAN FRANCISCO — Users in northern California could face a total power shutdown later this summer if they fail to curb their appetite for air conditioning.

Pacific Gas and Electric Co. (PG&E), which supplies electricity to most of northern California except the Sacramento area, has threatened to cut off all power to customers who disregard an order imposing an 80°F minimum

thermostat setting.

Only two classes of businesses — health care facilities and companies engaged in food preservation — have qualified for exemption from the 80° limit. All other groups, including DPs, must comply with the order or risk the consequences, according to George Amaroli, chief of the state Public Utilities Commission's energy conservation branch.

Amaroli assured users, however, that the commission would halt no

customer's power without ample warning and that the state energy agency would cooperate with any DP organization whose operations would be seriously impaired at 80°.

"We're not trying to put anyone out of business," he explained. "If a computer operator can show a bona fide reason why it would be hurt by the order, we'll look into it. But the reason must be set forth in a letter bearing the signature of a responsible corporate officer, and the letter must specify what piece of equipment would be harmed and why."

Although the utilities commission seeks "voluntary" compliance with the 80° limit, it has established a formal mechanism for enforcing the order, Amaroli said. If the commission receives a complaint about a suspected violator, it will issue only a verbal warning at first to the offending customer.

But if the violation persists and the agency receives a second complaint, it will send a written notice giving the offender five days to lower its air con-

(Continued on Page 8)

## Carter Gives Post Office Go-Ahead to Develop EMS

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — President Carter has given the U.S. Postal Service the green light to proceed with the development of domestic electronic mail services.

A five-page memorandum issued by the White House July 19 outlines Postal Service authorization to develop Electronic Message Service (EMS) facilities, but enumerates specific restrictions on any Postal Service forays into electronic transmissions.

The Postal Service had delayed implementation of a joint EMS venture with Western Union Telegraph Co. pending the outcome of an Administration review. The proposed Electronic Computer-Originated Mail (Ecom) service is still being contested by the Postal Rate Commission and in Congress [CW, June 18].

The Senate was scheduled to vote by the end of last week on Postal Service appropriations legislation that contains a provision forbidding the service to fund EMS.

Postmaster General William F. Bolger hailed the White House decision. "The President's policy statement is welcome news," Bolger said. "It is fair both to the Postal Service and the private sector, as well as being in the best interest of the public."

Industry reaction, however, was at

(Continued on Page 7)

## Intel Offers Service Plan For Older IBM Systems

By Don Leavitt

CW Staff

PALO ALTO, Calif. — Installations with "noncurrent" IBM operating systems have been offered "an insurance policy" against system problems in the form of a telephone hot line and, if required, on-site technical support from Intel Corp.

Introduced last week, Intel's Class-C service was described by Manager Fred Nisenholtz as more organized than the

support currently available from IBM for the older operating systems and available to more sites than the DOS-DOS/VS-only support offered by the Computer Lessors Association and run by The Computer Software Co.

Intel's service — "we pronounce it 'Classy'" — covers all releases of DOS/360, DOS/VS through Release 33, OS/MFT, OS/MVT, OS/VS1 through Release 5, OS/SVS through

(Continued on Page 4)

## IBM Throws Trial Course in Doubt

*Now I was born, I think, to be a protractor . . . I quickly realized in my early days at the bar that I could take the simplest antitrust case . . . and protract it for the defense almost to infinity.*

— Bruce Bromley, "Seminar on Protracted Cases" Stanford University, August 1958

By Connie Winkler

CW Staff

NEW YORK — Ex-judge and IBM counsel Bruce Bromley may have foreshadowed what IBM is up to in its recent request that IBM antitrust trial judge David N. Edelstein remove himself from the case because he is biased against IBM.

At the aforementioned Stanford seminar 20 years ago, Bromley told how he stretched a 1919 antitrust case to last 14 years and take up more than 50,000 transcript pages.

The elderly Bromley, who occasionally sits at the IBM defense table, has been bested by the IBM case, however. Only at the first trial stage, the IBM case is in its 10th year, has been in trial five years and cov-

## Analysis

ers 90,000 pages and hundreds of thousands of exhibits.

Now, with IBM's July 19 bombshell — the "bias and prejudice petition" filed against Judge Edelstein — the trial has been delayed again. The length of the delay will depend on when and how Edelstein decides and the length of any appeal by IBM to the U.S. Court of Appeals.

(Continued on Page 6)



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# Jury Deadlocks, Judge to Decide Outcome of Transamerica vs. IBM

By Jeffrey Beeler

CW West Coast Bureau

**SAN FRANCISCO** — Only two weeks after it began deliberating, the jury in the Transamerica Computer Co. vs. IBM antitrust trial declared itself hopelessly deadlocked, leaving the outcome of the \$390 million suit in the hands of Federal District Court Judge Robert H. Schnacke.

Although the deadlock clearly disappointed Schnacke, it did not come entirely as a surprise either to him or to the two litigants. Last December, when the seven-month trial began, both Transamerica and IBM anticipated the possibility of such an outcome and agreed to let the judge decide the case if the jurors proved unable to reach a verdict.

No one knows for sure exactly when Schnacke will announce his decision, but few sources here expect a verdict before September. On Aug. 1, the judge begins a month-long vacation, and a decision before then is considered highly unlikely.

The jury's final announcement that it had reached an impasse in its deliberations came at about 3 p.m. on July 19, when the foreman sent the court a message reading, "Judge Schnacke, we are deadlocked. We are unable to make any further advances and have only reached a decision on the first question of the special interrogatories."

Earlier during the deliberations, Schnacke had received four other, similarly worded notes from the six-man, four-woman panel. Each time, the judge persuaded the jury to continue deliberating and to try to reach a verdict.

"I certainly don't intend to take [the jurors'] first statement of deadlock as indicative of the fact that the extraordinary amounts of money the government has spent upon their welfare and support during these months should go down the drain," Schnacke informed Transamerica and IBM attor-

neys.

With each succeeding note, however, the jurors' distress and indecision became increasingly apparent, and by July 19 the 10-member body had clearly reached a stalemate. Still, Schnacke continued to cling to the hope that members of the jury might somehow resolve their differences; when he received the fifth note, the judge again asked them if further deliberations might lead to an agreement.

When the panelists unanimously vetoed the suggestion as useless, IBM lead attorney William Vaughn told Schnacke, "I think you could not have a clearer case of a hung jury."

"I'm afraid you are right," the judge reluctantly replied. Schnacke then summoned the jurors to his courtroom and, after one last effort to encourage them to continue their discussions, discharged them at about 4:30 p.m.

## Praise for the Jury

Although he expressed the wish that "the result had been different," the judge had nothing but praise for the jury's efforts. "You've been a tremendously faithful and friendly jury," he said. "I don't look upon this [deadlock] as any deficiency on the part of any of you. Quite the contrary, I think it is good evidence of your ability to view the case, to come to firm opinions about it, to have firm understandings as to what the case is about and what the evidence meant."

"I think had you been a less able jury, you might have been more willing to simply go along with the majority and assume that maybe somebody else understood it and if it was good enough for him, it was good enough for you."

The main stumbling block in the jury's deliberations seemed not to have been the question of whether IBM possessed monopoly power, but whether it abused that power.

On the question of whether the industry giant "had specific intent" to

monopolize any part of the DP market, the jurors voted 4-6, while on the question of whether Transamerica's alleged injuries resulted directly from IBM's actions, they were split 4-5 with one undecided vote. Trial transcripts gave no indication of whether the jury's balloting on those questions favored IBM or Transamerica.

Transcripts did show, however, that the jury split was roughly even for almost every issue in the case.

Only on the question of whether IBM held monopoly power in the general-purpose CPU, tape unit and disk unit markets did the body agree unanimously. On that score at least, the jurors found the defendant guilty.

The jury's dismissal came after only 11 days of deliberations, which began during the afternoon of July 3 and were interrupted by weekends, the July 4 holiday and the unexpected illness of the jury foreman. Schnacke clearly felt the jurors might have spent more time discussing the case, and that conviction apparently contributed to his insistence that deliberations continue as long as possible.

"There's been a tremendous investment of time and effort by everyone in this case," Schnacke told the jurors just moments before he bowed to the inevitable deadlock. "Your time of deliberation really hasn't been that long, considering the length of the trial and the complexities of it."

## Both Sides Confident

Asked for his reaction to the hung jury, Transamerica general counsel Walter Lewis voiced confidence in Schnacke's fairness.

But then he added, "Of course, it's always of concern when you think you have a case that you think should prevail to find a jury that doesn't agree with you."

IBM declined to comment on the deadlock except to reaffirm its "confidence in the judge's decisions."

## This Week

## NEWS

Crime Wrap-Up .....	4
Some Red Cross Centers Refuse Free Programs ..	5
Planning Automated Offices Topic of Workshop ..	7
Study: Call for RPG, Assembler DPs Waning ..	9
IDC Study Points to Hurdles in DDP for IBM ..	10
Eniac Developer Goldstone Gets Goode Award ..	11
New Machines Do Old Job: Windmill Design ..	13
Babbage Institute, Alips Join on History Project ..	14
House Scraps Rewrite, Begins Amending Act ..	16
Fireman's Fund Wets Down Training Costs ..	17
Unity Gives Florida Educators DP Buying Clout ..	18
Preconference Tutorials Scheduled for Compcon ..	20
Monitoring System Eases Strain on Power ..	21
CPU Schedules Track Events in Record Time ..	22
Upcoming Communications Meet Worries U.S. ..	23

## EDITORIAL

Editorial: Cheap Mass Storage .....	24
Human Connection: Systems Incompetence .....	25
Taylor Report: 'Forth' Becoming Hothouse .....	25
Programming Valuable to Inmates .....	25

## SOFTWARE &amp; SERVICES

'ASDM' Option Checks System Designs .....	31
Software System Manages Micro Investment .....	34
Package Boosts Graphics Options for 'Idea' .....	36
Package Cuts Paper Use as It Aids Debugging .....	38

## COMMUNICATIONS

Simulator Eases IBM-Based Networking .....	41
Device Emulates IBM Bisynchronous Terminals ..	42
TI Microprocessors Drive Sweda POS System ..	44
DP Vendor's Network Ties International Offices ..	45
Direct-Connect Modem Offers Built-In Dialing ..	46
Net Saving Garden Tool Maker \$140,000/Year ..	48

## SYSTEMS &amp; PERIPHERALS

Going On-Line Stems Mail-Order Tide .....	49
Voice Recognition System Upgraded .....	50
Two Printers Among Additions to Lexitron Line ..	51
Honeywell Slates Security/Privacy Seminars .....	54

## MINIWORLD

Model 900 Swells Ranks of Univac BC/7 .....	55
Western Micro Bundles Small Business Systems ..	57
Disk Systems Fit PDP-11, LSI-11 .....	58

## MICROCOMPUTING

Personal Computers May Find New Home .....	59
Apple Planning Same-Day Repair Service .....	60

## COMPUTER INDUSTRY

Energy Problems Threaten Silicon Valley .....	61
Raytheon Eyes Net of Maintenance Franchises ..	61
National Semi to Make More Scanners .....	62
Cbema Fighting for Service Contract Act Relief ..	63
Earnings Higher for Mainframes — Except IBM ..	64





Ohio Medical Indemnity  
evaluates software...

## Selects ADR's ROSCOE, LOOK and The LIBRARIAN.

Sorry about that, IBM.

### ROSCOE selected over TSO and VSPC.

"When we converted from DOS to VS1, we wanted a replacement for CMS," explained Joe Petras, Technical Support Manager (left). "We couldn't use TSO because it wasn't supported on VS1. So we evaluated IBM's VSPC against ROSCOE and concluded that ROSCOE was by far the better product for our program development.

"Even though we've now converted to MVS and could switch to TSO, our programmers are very happy with ROSCOE and don't want to change. Besides, TSO would utilize about 24% of the CPU's capacity. The entire ROSCOE system uses only 4-6% of total CPU. We now do almost everything in the systems area through ROSCOE.

Compared to our card environment, we see a probable productivity gain of 50-60%."

### ROSCOE speeds MVS conversion.

Gary Hall, Director of the company's Data Center (right), commented: "IBM and others indicated that conversion from VS1 to OS/MVS would take from 3-6 months. Using ROSCOE, we converted in record time—six weeks."

### LOOK tunes MVS system.

"We evaluated several performance monitors and concluded that LOOK was best suited for our needs," Mr. Petras said. "It gives us valuable information while using very little CPU."

"During our conversion to MVS, we used LOOK heavily to tune the system. Without LOOK, it would have been nearly im-

possible," added Mr. Hall. "We use it constantly to examine our environment—to improve response time and to evaluate requests for additional hardware and memory."

### The LIBRARIAN pays for itself in six months.

"We've been able to put our libraries on 30 cylinders instead of 150," commented Mr. Hall. "And we no longer have to compress our test library. The LIBRARIAN should justify its cost in six months."

Ohio Medical Indemnity, Worthington, Ohio, is the fifth largest Blue Shield Plan in the U.S. It pays over 14000 medical claims a day and answers thousands of subscriber information requests, 90% of them on the spot. Ohio Medical Indemnity has built a state-of-the-art data center. In only six years the company has moved from an IBM 360/30, through a 370/135, /145 and /158, and has just installed IBM's newest generation computer, the 3032.

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# Crime rap-Up

## No. 5

LANSING, Mich. — Gov. William Milliken signed H.B. 4112 into law earlier this month, making Michigan the fifth state in the country with a computer crime law.

Milliken signed the bill July 11. It takes effect March 20.

Florida, Arizona, Rhode Island and Colorado have similar laws on the books.

## Ristol Acquitted of Theft

LOS ANGELES — The accountant charged with stealing nearly \$1 million that was mistakenly deposited in his bank account is a free man, but his alleged accomplice is not.

Arne Ristol, the 53-year-old self-employed bookkeeper charged last October with the theft of \$927,288 from the United California Bank (UCB), was found not guilty of grand theft by a Superior Court jury here last week.

The bizarre case began 13 months ago when a keypunching error accidentally credited Ristol's account with \$927,288 meant for another commer-

cial account at the same bank. Ristol maintained throughout his trial that he had been deceived by business associate Ralph Ernsten, who claimed the money was actually a finder's fee for a real estate deal in which the men had been involved.

The episode is not over. Of the \$927,288 reported lost, only \$93,492 has been recovered, according to UCB.

Ernsten was indicted last February and charged earlier this month with conspiracy, grand theft and receiving stolen property. He will appear in court Aug. 8.

## Ferguson Gets Six Months

LOS ANGELES — Patricia Ferguson, arrested last February on charges of hatching an illegal funds transfer scheme with computer consultant Stanley Mark Rifkin, has received a six-month jail term for her part in that scheme.

As a part of her sentence, Ferguson was also ordered to be put on probation for five years following her jail term, undergo psychotherapy during probation and perform 2,000 hours of community service work.

The \$50 million wire fraud was attempted while Rifkin, a 33-year-old security expert, was out on bail awaiting trial for another computerized caper involving the Security Pacific Bank here [CW, Feb. 19]. However, the plot — which concerned electronically swapping money from the Union Bank in Los Angeles to San Francisco's Bank of America — was reportedly discovered by an undercover FBI agent, and both Ferguson and Rifkin were arrested before they could carry it out.

## Bowne Exec Pleads Innocent

LOS ANGELES — David T. Herr, vice-president of business development for Bowne Information Systems, Inc., pleaded not guilty here last week to charges that he tampered with the computer-stored data of a rival service bureau.

FBI agents arrested Herr on July 11, following his indictment by a Los

Angeles grand jury on 10 counts of wire fraud [CW, July 16]. During a seven-month period ending last month, Herr allegedly manipulated the "internal administrative" data of Proprietary Computer Systems, Inc. (PCS) on 196 separate occasions.

Herr's trial is scheduled to begin in Los Angeles on Aug. 28.

## Red Cross Center in Boston One of the Five Mavericks

By Tom Henkel

CW Staff

BOSTON — Dealing with about 400,000 annual donations, the Red Cross' Northeast Regional Center here is stepping out on its own in efforts to fully integrate its \$18 million-a-year operation.

Expecting delivery of a Burroughs Corp. B1855 dual processor in January, center officials hope the system will control general business applications, keep track of donors, improve the speed and efficiency of laboratory blood testing, and maintain hospital inventory control.

In buying the \$1.5 million hardware — which will replace a Digital Equipment Corp. PDP-11/40 — Northeast Director Timm Hurst said Boston just couldn't wait for national headquarters to catch up in the technology department. Headquarters has offered a set of programs free to local Red Cross organizations, but the Boston central has turned down the offer.

"At this point in time, the advantages of moving ahead with current data processing technology will more than offset the potential cost. The integrity of our system is what's important," Hurst said. "Hopefully, headquarters will borrow some packages from us."

A final contract for software and peripherals for the B1855 has not yet been negotiated, but the completed system will include four 130M-byte disk drives, one high-speed printer at the center's computing site in Needham, Mass., nine character printers — one at each of Northeast's six blood centers and three at the main Boston office — and about 70 CRT terminals which will be linked to the Needham site via three telephone lines.

In time, Boston plans to add optical character recognition to its laboratory analysis and hospital inventory equipment. Light pens and bar-coded blood packets will be used to process blood faster and more efficiently.

"Our inventory has a life of 21 days, which includes processing. After that it's federally mandated to be almost useless," the center's director of information services, Mike Gero, said.

### Big Business

The center makes an average of 40,000 shipments each month to surrounding hospitals. At an average cost of \$100 per hospital per delivery, maintaining the blood program becomes a big business.

"I don't want to overplay the notion that we're in business, but we're very concerned with the day-to-day issues of operation," Gero said.

The center is looking into commercially available software packages to support the new system. "We're going to look very hard at Burroughs' industrial offerings. When you go into something that sounds specialized, like blood banking, many applications have industrial counterparts."

"We're also planning to look at some of the software developments at other blood banks, including national headquarters. In that respect, we're trying very hard to work with headquarters."

The Boston center plans to have its new system partially operational about six months after delivery. Additional features will be phased in over the next two years.

The Northeast Center's program includes centers in Portland and Bangor, Maine, and in Peabody, Boston, Worcester and Springfield, Mass.

## Intel Offers Class-C Plan

(Continued from Page 1)

Release 1.6, OS/MVS through Release 3.0 and VM/370 through Release 4, Nisenholtz said.

Subscribers to the service use a toll-free number to call in their problems to a central technical support staff here. If the problem has already been reported and Intel has a fix for it, the corrective code is sent out immediately.

If the situation described by the user is not a known problem, Intel is willing to work on a solution to it, but that would be considered a separate transaction, chargeable at hourly rates.

Nisenholtz said the rate for on-site support would be about \$60/hour, but he didn't have a copy of the contract with him to confirm that fee. He has about 120 field personnel available for assignment under the Class-C service.

Intel chose the name for its service because all the systems covered are provided with only Class C maintenance by IBM. That, according to Nisenholtz, amounts to "local-only" support without much in a way of, for example, a centralized collection of fixes for known problems.

Intel's Class-C service starts today. The vendor's service people expect high activity at first as users clear a backlog of unresolved problems, but then a slowing down as they get stabilized. Though Class-C is provided un-

der a yearly contract, Nisenholtz noted that users can get adjustments in their payments if they migrate to operating systems for which IBM provides full Class A support.

He emphasized that the service is open to any installation regardless of where it acquired its hardware.

Monthly rates for the Class-C service range from \$175 to \$350, depending on the operating system being covered. More information is available from Intel's Computer Systems Division, 1801 Page Mill Road, Palo Alto, Calif. 94304.

### Corrections

In the article entitled, "Fiber Optics Exposition Slated for Sept. 5-7" [CW, July 9], *Computerworld* inadvertently devalued the sponsor's dollar by listing the registration fee of the one-day course as \$100 per person. The cost of the program, presented by Information Gatekeepers, Inc., is \$195.

"Expert Outlines Software Taxation Policies" [CW, July 16] left the reader with the mistaken impression that software is presently taxed in the State of New York. The author had intended the article to go on to explain that in 1977, New York found software to be intangible and therefore untaxable, a finding that paved the way for similar rulings in almost a dozen other states.

He split his own britches,  
but he had another pair!

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# Standardization Project Imperiled

## Some Red Cross Centers Refuse Free Programs

By Tom Henkel  
CW Staff

WASHINGTON, D.C. — You just can't please everyone when it comes to creating one set of programs for 57 autonomous blood centers across the U.S. — even when the programs are free.

With a system they hoped would save millions in programming costs, officials at the American Red Cross Blood Program's national headquarters here spent the past two and a half years developing eight programs in RPG-II to standardize national blood banking efforts. These programs, along with documentation and national-sponsored maintenance, are offered free to Red Cross affiliates.

At least five of the largest Red Cross affiliates have already said "no thanks" to the programs. They have opted to develop their own programs because, they said, headquarters' programs just aren't good enough to meet the needs of high-volume blood centers.

A sixth center, Los Angeles, is currently in the market for a new system. National leaders are currently trying to persuade that center to use the software from national headquarters.

In all, about 25 centers now use at least one of headquarters' applications. Another five centers are expected to be using them by the end of the year.

National officials — not pleased with maverick centers' actions — say there is nothing they can do. Each of the 57 centers is an autonomous organization, joined under a common charter. All budgeting and fiscal management is carried out at the local level.

### Refusals Stymie Plans

Large centers' decisions not to use the headquarters' programs — which are geared for IBM System/3, System/32 and System/34 hardware — are a stumbling block to the headquarters' long-range plans to develop a computer network linking all 57 centers.

To date, headquarters hasn't decided what system it will use for the national network, but some leaders are eyeing IBM's System/38 as a candidate. Headquarters is now urging local centers to lease one of the IBM systems that can handle RPG-II.

Some of the maverick chapters say the IBM systems under consideration don't provide enough memory to support a large donor base and a high volume of blood transactions. More efficient laboratory testing and recordkeeping techniques with optical character recognition (OCR) for bar-coded blood labels — a software capability that headquarters cannot yet supply — are also needed.

Nevertheless, national leaders say the maverick centers are making a mistake by not going along with the standardized system.

"There are a lot of Red Cross centers that have spent a lot of money needlessly. They have gone through this drill [of chucking one system for another] two and three times. There's no way we can stop them," John Jones, national DP director, said.

"I am taking the route that I am going to put my applications in 45 blood centers. Centers with non-IBM equipment will have to find some way to interface with the national system when the

time comes," he added.

A system with all the extras needed by large centers would be nice, but it would overwhelm some of the small centers who are just starting out in DP, according to Neal Boyle, the organization's national controller. "In the long run, the name of the game is standardization. The only way we can affect the economies throughout the Red Cross is to maintain one system."

### Wolf in Charge of Henhouse

To study the standardization problem, headquarters formed a DP steering committee about a year ago, chaired by Timm Hurst of the Boston-based Northeast Regional Center.

To some, Hurst's appointment was like putting the wolf in charge of the henhouse. The Boston center — which recently contracted to buy a dual-processor Burroughs Corp. B1855 with OCR capabilities — is considered by some to be the most radical of the mavericks.

But Hurst's appointment was no accident. "Boston was going on its own. We hoped by putting it in that position, it would come into the fold," Boyle said.

Hurst said it would be nice to go along with headquarters, but "I'm not a miracle worker." Much of the blood program was a hodgepodge of equipment long before headquarters got in-

involved in attempts to standardize it, he said.

"The whole concept and the way the thing was staffed initially wasn't particularly effective . . . With the falling costs of computers and the technology as it is today, it's cheaper to do stuff with minis, locally," Hurst said.

Users of the headquarters programs disagree. The Philadelphia center — which has almost as high a volume as Boston with 270,000 annual blood transactions and a 250,000-member donor base — is installing two IBM System/34s. Since the programs are free, Philadelphia can spend its DP money on programs missing from the national lineup.

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# Latest IBM Move Leaves Trial Future in Doubt

(Continued from Page 1)

"The whole thing is mind boggling. I have never known such an appeal," A.G.W. (Jack) Biddle of the Computer & Communications Industry Association (CCIA) said. Biddle has religiously read daily transcripts of the case.

"If IBM felt there was a prejudice, it should have brought it up earlier. My understanding was that IBM hand-picked Judge Edelstein."

IBM's 2,000-page, nine-volume petition detailed what the firm sees as gross abuses of judicial power by Edelstein in his many rulings for the Justice Department, in his alleged suppression of IBM evidence and in what IBM sees as harassment of its witnesses.

For example, IBM pointed to the 79 motions Edelstein has ruled on, 74 of which favored the government. "I have never seen, before or since, a human being wield and abuse his granted power and authority in such a demeaning, inconsiderate, abusive and despotic manner," IBM's last witness said in his contribution to the bias petition before the trial adjourned April 10.

## Long Time in Preparation

Because of the cross-referenced and lengthy narratives IBM has included in the volumes and because they are

bound in professional legal fashion, it is apparent IBM worked on the bias petition a long time. It was probably planned long before IBM's lead counsel, Thomas D. Barr, asked for an adjournment on July 9 so IBM's board of directors could review the case.

When making that request, Barr implied the board of directors' action would speed the trial and be in the best interest of the court, and justice.

"Now more than ever, the Justice Department sees the IBM request as a tactic to delay the trial," Robert J. Staal, head of the government's trial team, said.

Staal said the Antitrust Division has asked Edelstein's permission to respond to IBM's request that Edelstein excuse himself from the case and appoint another judge to take over. Edelstein last week agreed, giving the government an Aug. 6 deadline.

"Needless to say, we don't think the incidents alleged show bias and prejudice," Staal said.

The Justice Department's response will look at whether the petition is timely, fairly represents the trial and is legally sufficient. The alleged bias and prejudice must be of extrajudicial origin — based on something outside the trial, Staal maintained.

When Edelstein received the petition July 19, he said he would reserve comment for later. He then added that the

IBM filing would be dealt with "appropriately and expeditiously." (This latest IBM petition came just after Edelstein had spent three months out-

## Analysis

side the courtroom, ruling on 17 motions including a giant document request favoring the government.

### Observers' Reactions

How observers of the case feel about the bias and prejudice petition depends on where they stand on the monopoly case itself.

CCIA's Biddle doubts that other judges will interfere with Edelstein's handling of the case, which IBM said has two years to go. If anything, the record is replete with IBM misleading questions and hidden documents, Biddle added.

"I think the judge has lost his respect for the legal ethics of the Cravath team," he said. (IBM's counsel is Cravath, Swaine & Moore.)

Biddle continued: "In my reading of the transcript, I felt there appeared to be a pattern [by IBM] of assigning attorneys on a rotating basis who seemed to drive the judge up a wall."

"Is that an accident? I have often wondered."

### Inconsistent Treatment

"The inconsistent treatment of IBM and government witnesses is one of the hallmarks of this case and reveals persuasively the judge's bias did not originate from a fair hearing of the evidence," according to lawyer Calvert Cray, who prepares a litigation review for the brokerage firm of Bache Halsey Stuart Shields, Inc. of New York.

"This is not just a mild case," Cray said about the alleged abuse IBM has

endured under Edelstein, abuse which Cray called "truly monumental."

In his July 11 litigation report, Cray correctly predicted what action IBM would take after IBM's head counsel pleaded for a 10-day adjournment so that attorneys on the IBM board could review the case.

Cray argued that IBM was pushed to this action after Edelstein's June 25 order that IBM turn over an estimated five billion post-1974 documents at a production cost of \$1 billion. The order, made in connection with the scheduled cross-examination of IBM Chairman Frank T. Cary, was "the most burdensome and punitive trial subpoena ever ordered by a trial judge," Cray said.

### Scenario Predicted

Cray confidently predicted the following scenario for the next several months: Edelstein will rule he is not biased or prejudiced, and IBM will appeal to the U.S. Court of Appeals. Then, behind-the-scenes negotiations during the appeal will force Edelstein off the case.

A new district court judge will then be assigned to the case, both sides will agree to accept the present record (purge of Edelstein's bias) and the trial will resume a faster clip, Cray forecast.

"There are so many things Edelstein could have done [to speed up the case], it's sickening," Cray said in an aside.

However, at this point the Justice Department — without Edelstein's strong and predictable support — may be convinced to settle the case, Cray suggested.

He is not alone in predicting a settlement in the coming months. Other Wall Street IBM watchers voiced similar opinions, but asked not to be quoted.

## CAD/CAM, Procurement Subjects of AIIE Meets

SANTA MONICA, Calif. — The American Institute of Industrial Engineers (AIIE) will sponsor two events in late September.

The first, a major conference on "Computers and Manufacturing," will explore the emergence of DP equipment as essential tools for every aspect of manufacturing.

This event will be held in New York Sept. 24-26 and will feature speakers from manufacturing companies implementing computer-aided design and computer-aided manufacturing (CAD/CAM) systems as well as vendors making such equipment.

Then, in Washington, D.C., on Sept. 25-27, AIIE will sponsor a government industry seminar on "Federal ADP Procurement." This seminar will bring together executives from government and industry to review and discuss the status of new ADP procurement policy and procedures.

In addition, participants will share experiences with current procurement requirements and assess future developments.

Further information about the two events can be obtained from Department PR, AIIE Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

## Pair of IBM 370/158s Auctioned for \$1 Million

(Continued from Page 1)  
ing the auction thought it belonged to ITEL.

In recent months, ITEL has experienced severe losses associated with its computer business primarily because of the impact of IBM's 4300 introduction. However, "The 4300 had nothing to do with [this sale]," one of the principals associated with the sale noted. "Ohio Bell simply wanted more power, so it installed an IBM 3033."

The auction was held by Guarantee Appraisal Corp. (GAC), a firm which guarantees the appraisal of the liquidation value of equipment pledged against a loan or lease. GAC was acting as ITEL's agent for the disposition of the equipment.

GAC claimed a public auction would help stabilize the confusion over prices of IBM 370 equipment which has resulted from their introduction of the 4300.

However, the two processors sold for just about the amount lessors had forecast.

Auctions of computer equipment are not very common, one lessor noted, adding that dealers are not comfortable buying the equipment this way. A repossessed IBM 360/30 was auctioned at the Park Bernat Gallery in New York in 1971, he recalled.



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## Green Light on Ecom Given To Postal Service by Carter

(Continued from Page 1)

best mixed. "We're pleased the President has seen the need for minimal government participation [in EMS] — he recognizes that you can't have a monopoly and a competitive entity in the same marketplace," said A.G.W. Biddle, president of the Computer & Communications Industry Association, an active opponent of Ecom.

However, Biddle said he would have preferred that the Postal Service be barred from operating any transmission network, even one supplied under contract by an independent carrier.

The Postmaster General was vague about the schedule for Postal Service implementation of Ecom. "Although today's [Presidential] action is important," Bolger said, "no one should jump to the conclusion that an electronic mail system of any large scale is just around the corner. It is not, because it remains to be seen how ready the public is to accept and use such a system. The Postal Service will proceed carefully into this field."

According to a Postal Service spokesman, Robert Becker, no decision has been made on when to proceed with Ecom service. A 15-month experimental phase using Western Union Mailgram facilities already in place in 25 U.S. cities is contemplated.

### Eight Conditions

According to the White House memo, "The national interest requires a Postal Service which can serve all Americans and interface with the world's postal services efficiently and economically. The service has progressively achieved productivity improvements by mechanization and automation in processing conventional mail."

"A Postal Service EMS is the logical next step to achieve further cost reduction and mail processing improvements. It allows [the Postal Service] to improve efficiency and economy of mail service by continuing to use technological advances to increase productivity, speed and dependability of services."

Carter's endorsement of the project carries eight conditions, which the White House said "will ensure that all forms of electronic communications will be open to full and fair competition." The eight conditions, which have been accepted by Bolger, are:

- The Private Express Statutes, which guarantee Postal Service monopoly of letter delivery, will not be extended to cover electronic transmissions.
- Taxes or revenues from existing post office services will not be used to subsidize Postal Service EMS.
- Postal Service EMS will be "established as a separate entity for accounting and rate-making purposes to ensure that it is operated in a competitive fashion and to avoid the cross-subsidization of electronic services by regular mail services."
- The new services will be "available to all electronic carriers at the same rates as those [the Postal Service] charges itself."
- The EMS offerings will be reviewed within five years, "before the major investment is made," to evaluate competitive impact and "to ensure that no cross-subsidies or other anticom-

petitive actions are involved."

- The Postal Service will obtain transmission services commercially rather than develop its own network.

- The Postal Service will work with the American National Standards Institute and private industry to develop interface standards "to ensure that interconnection with the mail delivery system is available to all companies."

- Rates for the new service will be regulated by the Federal Communications Commission, which will oversee rates for the transmission portion of the project, and by the Postal Rate Commission, which will set rates for delivery of hard copy generated electronically.

## Planning an Automated Office Topic of September Workshop

GUTTENBERG, N. J. — Planning and implementing a cost-effective automated office will be the focus of a three-day conference in Princeton, N. J., on Sept. 24-26 sponsored by Office of the Future, Inc. (OFI) here.

Divided into two segments, the "Advanced Executive Technology Forecast and Workshop" will deal with the technological and corporate impacts of office automation as well as its effect on a company's basic needs and goals, an OFI spokesman stated.

The first day will be geared toward senior executives and pinpoint what technology is available and exactly

what type of company policies should be drafted. The remaining two days will be patterned on a workshop approach.

Besides examining how to identify and introduce cost-effective office automation projects, the workshop will also cover feasibility studies, opportunity analyses, proposal guidelines, and vendor negotiations.

Led by OFI President James H. Carlisle, the three-day meeting costs \$640 per person. However, interested executives can attend the first-day session for \$95.

Further information is available from OFI at 7002 Boulevard E. Guttenberg, N. J. 07093.

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# California Users Must Set Thermostats at 80°

(Continued from Page 1)

ditioner thermostat to an acceptable level. At the same time, the commission will pass word of the violation to the U.S. Department of Energy which, unlike state agencies, can impose fines with its sanctions.

If the customer continues to defy the commission's orders five days after receiving a second warning, its flow of electrical power will cease, Amaroli warned.

## Effect on Equipment?

The order requesting DPer's and others to set their air conditioner thermostats at 80° or higher raises the crucial question of whether large-scale systems can operate safely and efficiently at such high room temperatures.

Although many vendors warn of the ill effects of operating their equipment without full air conditioning, Amaroli voiced doubt that the 80° limit would hinder system performance or result in

hardware damage. "I've never heard of a computer system yet that couldn't operate at 80°," he said.

Reactions from several large systems vendors seemed to confirm Amaroli's view. A spot check of industry sources revealed that most systems can operate at temperatures as high as 85° to 90° with little risk damage or degraded performance.

## Would IBM Write?

Amaroli, who spent nine years as a field service engineer for Hughes Aircraft Co., has invited mainframe manufacturers to contact him by letter if they believe an 80° thermostat limit would endanger their hardware. Thus far, however, he has received not even one such letter, and he foresees little probability of receiving a vendor complaint in the future.

"Do you think IBM is going to write me a letter saying its equipment is so lousy it won't operate at 80°?" he asked rhetorically.

Amaroli voiced suspicions that most users who object to the 80° minimum setting are concerned more with guaranteeing their personal comfort than with protecting their hardware.

PG&E's decision earlier this month to impose the limit on thermostat settings again illustrated the pains the utility must take to maintain adequate levels of precious reserve power.

## Dangerous Levels

More than once during recent months, the company's reserves have fallen to dangerously low levels, a PG&E spokesman conceded here last week. In mid-June, a spell of unseasonably hot weather briefly sent reserves plummeting to an alarming 4%, and twice since then they have slumped to 5%.

By comparison, California's five utilities have collectively recommended a minimum reserve power level of 15%.

For the moment, PG&E's power reserves stand at a comparatively comfortable 10%, thanks in part to last week's reopening of the Rancho Seco nuclear power station, which was shut down for inspection following the crisis at the Three Mile Island generating plant near Harrisburg, Pa. But as northern California enters its warmest season of the year, growing demand for air conditioning and other electrically powered services will almost surely drive PG&E's reserve levels down again, the spokesman predicted.

As long as the peak demand seasons in northern and southern California occur at different times of the year, the state's electricity consumers should survive the coming months without undue difficulty. But if the peak demand periods in the two regions coincide, power shortages and possibly blackouts could soon follow, the PG&E source cautioned.

# SNA at Heart of IBM DDP

(Continued from Page 1)

munications System" and related products from the vendor's Office Products Division — making IBM a supplier of automated offices.

"SNA now provides IBM with the framework for fully integrated product lines to form the elements of distributed systems, something the company did not have in the early days of SNA. This can assure the user of product and system continuity for many years to come," Datapro declared in "IBM's Approach to Distributed Processing," a report available for \$12.

"In a nutshell, SNA is the overall discipline for coordinating the activities of multiple remote terminals accessing multiple applications running in one or more IBM host computer system," Datapro said. SNA "simplifies the initiation and maintenance of complex interconnections among host processors and dumb/intelligent terminals."

Before 1975, IBM was not a strong

competitor in the data communications marketplace, the report observed. Although many users managed to implement successful remote processing systems based on IBM hardware, the vendor offered communications capabilities only through expensive and slow devices supported by complicated software and line protocols.

At that time, the IBM host site had firm control of the total system, loading software programs down-line to remote terminals. Released in December 1973, IBM's 3790 communications system epitomized this concept, but eventually proved itself a marketing failure because users disliked its pricing, complexity and inability to generate programs at remote stations, according to the report.

The 3790's flop may account for IBM's subsequent policy reversal on data communications, Datapro hinted. Whatever the reason, the vendor began in earnest to incorporate communications capabilities within numerous product lines and, starting last year, adopted the terms "distributed processing" and "distributed systems" in marketing literature and even in the names of products.

## The 8100: 'Missing Link'

Datapro called IBM's 8100 system the vendor's "missing link" in plans for distributed processing. Announced last fall [CW, Oct. 9], with first deliveries scheduled for August, the 8100 comes with a choice of two operating systems: the Distributed Processing Control Executive (DPCX) and the Distributed Processing Programming Executive (DPPX).

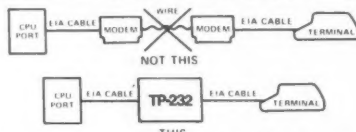
Running under DPCX, the 8100 resembles the ill-fated 3790, the report said. In fact, the 32-bit system reportedly can execute 3790 software.

Under DPPX, the 8100 handles Cobol and Fortran tasks and provides transaction processing and emulation of IBM's 3270 display stations. The 8100 can replace 3270 series controllers without host program change and can function as a host-controlled distributed system in the style of the 3790, Datapro added.

The report is available from Datapro at 1805 Underwood Blvd., Delran, N.J. 08075.

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# Study: Call for RPG, Assembler DPer's Waning

By Marguerite Zientara

CW Staff

MISSION VIEJO, Calif. — The demand for programmers with expertise in the RPG and assembler languages may be declining, according to a study conducted by 200 DP students at Saddleback College here.

To analyze the relative demands for programming jobs for various languages in the Los Angeles area, the students used the Sunday, April 22 edition of the *Los Angeles Times* for their source data. Enrolled in the "Introduction to Computer and Information Science" course, they extracted and keypunched information from the "Help Wanted" section of the newspaper as the first step in their project.

The students found a total of 453 DP jobs listed in the issue, 174 of which stated a language preference.

After the data was gathered, the Cobol students wrote programs to ana-

made between the two studies, Robert W. Bliss pointed out. Bliss is a business science instructor at Saddleback College.

Although the percentages would seem to indicate a definite drop in demand, it should be noted that the Southwest Texas survey was national while the Saddleback survey included the Los Angeles area only, he said.

"We have a number of minicomputer manufacturers in our area," Bliss said. Basic/Four Corp., Computer Automation, Inc. and Microdata Corp. all have their corporate headquarters within five miles of Saddleback's campus.

"It may be that those companies' aggressive marketing efforts have increased the demand for Basic, with re-

(Continued on Page 12)

## FIRST LANGUAGE SPECIFIED

	NUMBER OF ADS	PERCENT
Cobol	102	58.6
RPG	19	10.9
Fortran	17	9.8
Assembler	11	6.3
Basic	8	4.6
PL/I	5	2.9
Pascal	1	0.6
APL	0	0
Other	11	6.3
Total	174	100.0

## SECOND LANGUAGE SPECIFIED

	NUMBER OF ADS	PERCENT
Cobol	11	17.7
Assembler	11	17.7
RPG	9	14.5
Basic	5	8.1
Fortran	4	6.5
PL/I	4	6.5
APL	1	1.6
Pascal	0	0
Other	17	27.4
Total	62	100.0

Saddleback College survey results show the relative demand for various programming languages.

Of the 453 ads analyzed, 62 sought experience in more than one language.

## FIRST AND SECOND LANGUAGES SPECIFIED

	NUMBER OF ADS	PERCENT
Cobol	113	47.9
RPG	28	11.9
Assembler	22	9.3
Fortran	21	8.9
Basic	13	5.5
PL/I	9	3.8
APL	1	0.4
Pascal	1	0.4
Other	28	11.9
Total	236	100.0

Chart combines and tabulates the requests for all languages, either first or second preference.

## SOUTHWEST TEXAS UNIVERSITY SURVEY: DEMAND FOR PROGRAMMERS

Cobol	47%
RPG	17%
Assembler	14%
Fortran	10%
Other	12%

This illustrates the results of a similar, but nationwide, survey of programming languages demand conducted — a year prior to Saddleback College's — by Prof. Marvin A. Johnston and others at Southwest Texas State University.

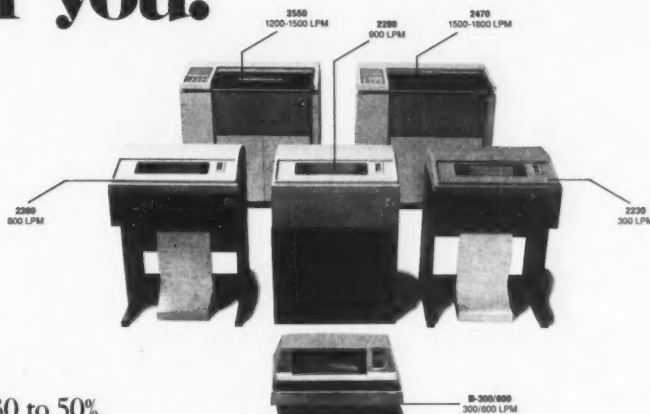
lyze the demands for various languages, including Cobol, RPG, Fortran, assembler, PL/I, Pascal, APL and "other."

While their findings concerning the demand for Cobol and Fortran were almost identical with a study conducted one year earlier by Prof. Marvin A. Johnston at Southwest Texas State University [CW, May 8, 1978], the Saddleback students found an approximately 59% lower demand for RPG and assembler a year later.

The Southwest Texas study, based on 486 responses to a questionnaire sent to 1,200 companies using computers, showed that 47% of those questioned preferred Cobol, 17% preferred RPG, 14% preferred assembler and 10% preferred Fortran. Twelve percent named other languages.

Basic, PL/I, APL and Pascal were not included in the Southwest Texas study, so precise comparisons could not be

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# IDC Study Points to Hurdles in DDP for IBM

By Marcy Rosenberg  
CW Staff

WALTHAM, Mass. — Though IBM is targeting a diversified and aggressively priced group of products for distributed data processing (DDP), the industry heavyweight will have to jump several hurdles before gaining a strong foothold in this \$1.1 billion market.

These obstacles, according to a user survey recently released by International Data Corp. (IDC) here, include:

- IBM's late start in DDP, a market penetrated early on by minicomputer vendors such as

Digital Equipment Corp., Hewlett-Packard Co., Data-point Corp. and Four-Phase Systems, Inc.

- Protracted deliveries on IBM's newer DDP offerings, notably the 4300 and 8100 systems. Deliveries of the 8100 are just beginning in the third quarter.

- IBM's weak track record for educating its user base in new industry concepts such as DDP, where processing tools may be ordered by computer-trained DP department managers but will actually be used by less skilled end-user departments. This is particularly

true for the 8100, which is host-controlled but resides at the data input source.

Nevertheless, the sheer size of its marketing and service organization places IBM in a strong position to support equipment located in remote, hard-to-reach sites.

Another factor working in IBM's favor is its broad DDP product line. While it touts the 8100 as its flagship DDP product, the company began plugging other of its Data Processing Division (DPD) as well as General Systems Division (GSD) lines for the DDP market, although the primary marketing thrust for these products has been for applications other than DDP.

These products are the Series/1, System/38 and the 4300 line.

## Survey Statistics

IDC surveyed 150 installations. Of these, 94 were DPD sites with IBM 360, 370 and Series 30 mainframes installed, while 56 were drawn from GSD users including System/3, System 32 and System/34 installations.

Because IBM announced its 4300 series midway through the interviewing process, IDC queried only 35 of the 150-user sample for early reactions to that processor family. Those questioned were System 370/138 or larger sites.

Survey findings showed that 28 DPD sites, or 30% of those interviewed, ordered one or more 8100s. The bulk of the orders — more than 64% — were placed by 370/158 and larger sites, indicating a trend of growing acceptance of DDP among larger users, IDC noted.

The desire to get early delivery positions spurred 28% of the respondents to place multiple orders, with most planning to use only a fraction of the number ordered.

Another 27% stated they were genuinely involved in DDP and the 8100 met their needs. Attracting 14% were the 8100's price/performance features, while an equal number ordered the system to upgrade existing equipment (usually IBM 3790 terminal-based systems) or to prolong the life of the host.

Twenty-eight percent of the 8100 customers indicated they had no clear idea of how to implement the processors. And even more vague were users' plans for implementing associated 8100 peripherals such as the 8775 CRT terminal. A "substantial" two-thirds of the users ordering the 8100 processor were not sure whether they would buy the 8775.

Most users planned to take advantage of the 8100's capability to interact with a host — such as an IBM 370, 30 series or 4300 processor — with 86% expecting to use the system to communicate with a host at the same location and 7% planning to connect it to a remotely located host.

Users were fairly evenly divided as to whether to use the processor to communicate with other 8100s at the same site. Only about 10%, however, will link the system to other remote 8100s.

Once installed, however, the 8100 will play a greater role in site-to-site communications, IDC predicted. Mainframe off-loading and "branch file" updating will emerge as major applications, the report forecast.

Turning to IBM's 4300 series of processors, 23 of the 35 users questioned (66%) planned to order one or more systems. Of these potential customers, 57% chose the 4341 and 43% selected the 4331.

Almost 70% of these orders came from IBM 370/148 and 370/158 sites, the majority selecting the 4300 as a means to supplement existing DP operations rather than as a replacement system. What lured other users to the 4300 series

were its capability for mainframe off-loading and its potential for DDP.

## Reaction to System/38

IDC also surveyed user reaction to the System/38. Of the 150 sites interviewed, five DPD and 16 GSD installations ordered this system, most intending to upgrade an existing IBM System/3. The study found System/32 and System/34 sites less apt to upgrade their present systems.

Other users ordered System/38s with an eye to particular applications. Between GSD and DPD users, about 45% plan to use the system for order entry, accounting and general business functions, while nearly 25% intend it for manufacturing applications.

While GSD and DPD users had similar applications in mind, GSD users were less inclined to configure the System/38 to communicate with a host. More than 60% of GSD sites, compared with 40% of the DPD sites, expect to use the System/38 as a stand-alone processor. System/38s at 37% of the GSD and 40% of the DPD installations will interact with a host, the survey indicated.

As for the 4300, primarily designed as a migration path for existing IBM low-end and mid-range 370 users, IDC predicted a "serious" product confrontation with the 8100 only in situations where users are reaching to the upper limits of the 8100.

The survey, entitled "IBM's DDP Products: Product Analysis and User Reactions," costs \$2,500 from IDC at 214 Third Ave., Waltham, Mass. 02154.

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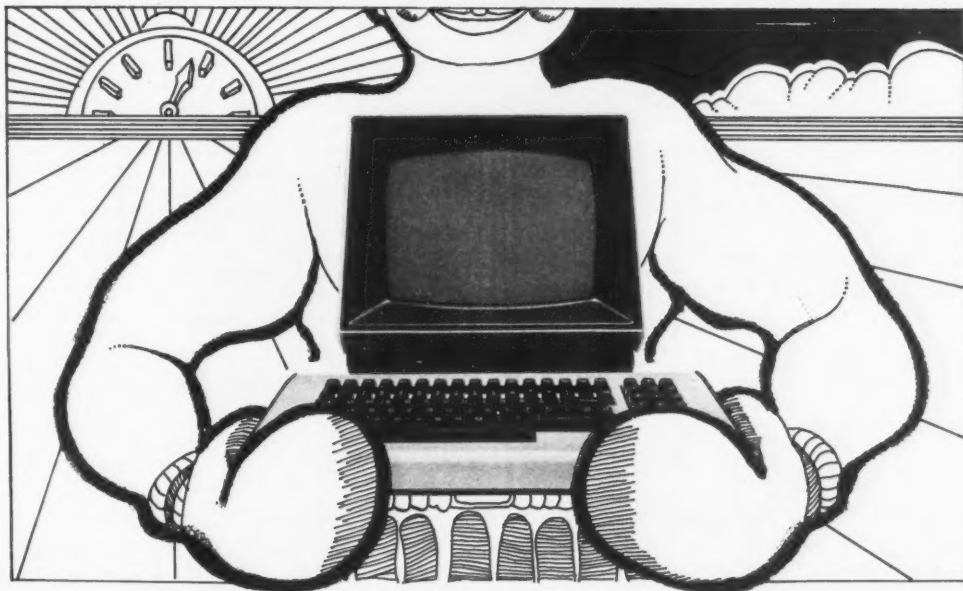
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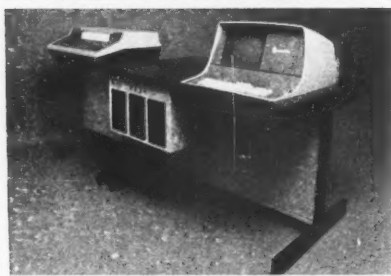
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## Eniac Developer Goldstine Gets Afips' Goode Award

MONTVALE, N. J. — Dr. Herman Goldstine of the Institute of Advanced Study (IAS) has been awarded the 1979 Harry Goode Memorial Award for his pioneering work in the development of the modern stored-program digital computer.

The award, established in 1964 by the American Federation of Information Processing Societies, Inc., (Afips) is given annually to honor and encourage outstanding contributions to the information processing field.

Goldstine was recognized for his "support and major contributions to the development of the Eniac; for his pioneering work on the logic, design and coding of electronic computers; and for his leadership role in the design, construction and use of the IAS machine at the Princeton Institute for Advanced Study," according to Afips President Dr. Albert S. Hoagland, who presented the award.

Hoagland also cited Goldstine's "sig-

nificant contributions to the theory and practice of matrix computations; his encouragement of young scientists and mathematicians to explore the use of electronic computers; and his pioneering analysis of the history of computing."

After securing Army backing for construction of the Eniac, the first electronic computer, Goldstine became the technical director for the project. Goldstine and John von Neumann, recognizing the revolutionary potential of electronic speeds in computation, began a long collaboration to lay the intellectual foundations for the computer age.

After designing the first stored-program machine, built at IAS in 1946-1950, Goldstine then ran the institute's computing center. He joined IBM in 1958 and created a mathematics group that has become a world center for the mathematics of computation.

In 1969, Goldstine was made an IBM Fellow. He chose to locate at IAS and to concentrate on recording the history of computation. He is currently writing a book on the history of the calculus of variations.

Goldstine has authored three books and more than 40 papers and has received numerous awards and honorary degrees.

## Two Languages In Less Demand

(Continued from Page 9)

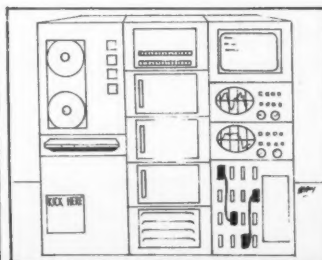
sulting impacts on RPG and assembler," Bliss added.

On the other hand, the one-year difference in the timing of the studies may indicate a real decline in demand for RPG and assembler, according to Bliss. "We plan to have future classes repeat the *Times* survey in the hope of detecting any increasing or declining trends in language demands so we can redesign our curriculum accordingly," he said.

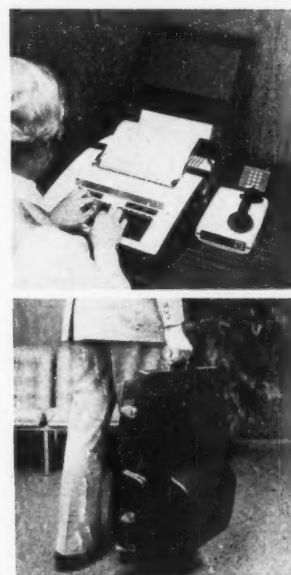
"The third possibility is the difference in the nature of the source data," Bliss said. "Many DP jobs are not advertised, but are filled through employment agencies. If for some reason programming jobs in RPG and Assembler are more likely to be filled via agencies, that would account for the variance in the apparent demands indicated by the two studies."

Saddleback College does not plan to stop its quest for the truth about programming languages demand, however. "We plan to send questionnaires to DP managers in the L.A. area as well as other parts of the country to see whether there is a difference in the data collected through questionnaires as opposed to classified ads," Bliss said.

The school also wants to determine whether there are differences in programming languages used in different parts of the country. "Our goal is to turn out entry-level programmers with skills in languages that are in demand in the real business world," Bliss concluded.



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# New Machines Do Old Job: Windmill Design

By Marguerite Zientara

CW Staff

WINDSOR LOCKS, Conn. — Don Quixote, stand back! A giant windmill capable of producing electricity for 1,000 Swedish homes is being designed with the help of computers by the Hamilton Standard unit of United Technologies Corp. here.

Working under a multimillion-dollar contract with Sweden, Hamilton Standard aims to show that harnessing the wind can be cost-competitive with conventional electricity generation and that Sweden can ultimately build "windmill farms" across the country.

While Karlskronavarvet AB of Sweden will construct the actual windmill tower, foundation and generator housing, Hamilton Standard is designing the rotor, designing and making the blades and performing computer analyses for optimum design of the complete system.

Computer analyses are particularly needed in the project because of the large size of the proposed windmill. "The only larger machine under consideration now is a 300-foot-diameter windmill being designed by Boeing Corp. for the Department of Energy in this country," according to Thad Hasbrouch, new products manager and one of the engineers working on the project for Hamilton Standard.

Sweden's prototype windmill, scheduled to be operational by the end of 1981, will be a bit smaller than that, with a diameter of 255 feet from one end of the two-bladed rotor to the other, Hasbrouch said, noting it is still a "very large" windmill.

The windmill will produce up to 3M watts of electricity continuously "once you get winds above the rated speed," Hasbrouch said. Specifically, the windmill will generate 3M watts at wind speeds of 31 miles per hour measured at the center line of the hub, which is 262 feet in the air.

That wind speed at 262 feet up corresponds to about 27 mph at a 30-foot height. Below the rated wind speeds,

Hasbrouch said, the windmill will put out proportionately lower amounts of power.

## High Technology Imperative

The computer analyses, expected to be finished by early next year, will work on several programs designed to take into account such things as critical blade speeds, wind conditions and stress. "The windmills just don't get designed without a fairly sophisticated computer analysis," Hasbrouch remarked.

"Since the blade and rotor are unique to wind turbines," Hasbrouch said, "this is where the high technology portion of the activity occurs."

Engineers can completely model the rotor system in a digital simulation and

evaluate its performance in several modes of operation, he said. As an example of the type of simulation Hamilton Standard might run on the windmill blades, Hasbrouch cited the firm's "widely known proprietary program, F-762," which allows engineers to model the blade "as a coupled elastic beam with twist."

In other words, "we can completely dynamically simulate the action of the blade, including its aero-elastic deformations as it moves through the air, to determine their effects on its performance."

## Variables Input

"Also input into the program are the effects of such things as wind differences brought about by different ori-

ginating elevations and various forms of gusting or other turbulent wind conditions.

"From this, our computer will print out the various stress loads the windmill would see under certain circumstances, so we can then design the windmill to withstand the kinds of loads it will actually experience in service," Hasbrouch said.

In addition, the computer will indicate the best way to design the windmill for long periods of time. "As a matter of fact, we design most of our equipment for what we call 'infinite life,'" Hasbrouch said.

"That means it will withstand many, many more cycles than it is expected to see in the design lifetime of the windmill."

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# Babbage Institute, Afips Join on History Project

LOS ANGELES — After working separately to develop a history of information processing, the Charles Babbage Institute for the History of Information Processing (CBI) and the American Federation of Information Processing Societies (Afips) have joined forces.

According to an agreement signed by CBI President Erwin Tomash and Afips President Dr. Albert S. Hoagland, Afips will become a major financial sponsor and an active participant in CBI affairs. Afips will contribute \$50,000 a year in support of history activities

and will name four of its members to the CBI board of trustees.

CBI's activities will take place in a "Center for the History of Information Processing," Afips said, to be located at an "easily accessible major university with graduate programs in information processing and in the history of science and technology."

Before the agreement with CBI, Afips had been planning to establish its own Center for the History of Computing [CW, Aug. 14].

Since the amount of work to be done "is beyond the financial capabilities of either party working alone," according to a joint statement made by Afips and CBI, the two organizations decided to merge their efforts, a move that was unanimously approved by both



Afips President Dr. Albert S. Hoagland (left) looks on as CBI President Erwin Tomash signs Afips-CBI agreement.

groups' boards of directors.

CBI will match a \$50,000 annual contribution from Afips on a two-to-one basis, with those matching funds to come from CBI's institutional mem-

berships and from individual members.

Institutional support has been promised by Amdahl Corp., Arthur Young and Co., Bell Telephone Laboratories,

Control Data Corp., Honeywell, Inc., IBM and others.

Both CBI and Afips are known for their efforts to record and preserve computer history. CBI, formed in late 1977 by Tomash — founder and chairman of Dataproducts Corp. — is a nonprofit corporation established to, among other things, start and maintain an archival center.

Afips, a group of 13 nonprofit educational, scientific and professional organizations, recently published its first issue of *Annals of the History of Computing*, a quarterly journal to make available information on the heritage of the computing and information processing fields for scholarly and educational purposes.

The group has also launched a number of activities through its History of Computing Committee, including the publication of a booklet called "Preserving Computer-Related Source Materials" (see story below).

In a joint statement, Hoagland and Tomash said, "We view this as a marvelous opportunity for Afips and CBI to work together to chronicle the information revolution, which is having such a profound impact on the world."

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## Hang on to Everything, Please

MONTVALE, N.J. — Computer professionals may not think of themselves as sources of important historical documents, but a committee of the American Federation of Information Processing Societies (Afips) thinks otherwise.

The Afips History of Computing Committee, worried that little attention has been given to the historical study of computers in spite of their impact on society, wants computer professionals to set aside many of their records — personal and professional — for use by archivists and researchers.

To help potential contributors determine what is worth saving and how to go about it, Afips has published *Preserv-*

ing Computer-Related Source Materials. The seven-page booklet details what to save, how to save it and why certain materials are important to historians and researchers.

According to the booklet, "If we are to adequately and accurately assess the significance of the computing field in future generations, it is imperative that computer professionals recognize the need to preserve their heritage now."

Among the things Afips would like to see preserved for study are correspondence, working papers, unpublished reports, obsolete manuals, key program listings used to debug and improve important software, hardware and componentry, engineering drawings and financial records.

Computer professionals tend to be "forward-looking," Afips said, and therefore discard those things that are obsolete. But such things as outdated manuals "are very important in tracing the development of ideas," according to the booklet.



"Because It's a Shared File, That's Why."

Saving such items may help historians understand the changes brought about by the introduction of computers into society, Afips said.

Copies of *Preserving Computer-Related Source Materials* are available free from Afips, 210 Summit Ave., Montvale, N.J. 07645.

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# Why do you think they call it a dump?

**dump/A dull, gloomy state of the mind, low spirits . . . A thick, ill shaped lump or hunk of anything . . . To deposit something in a heap or unshaped mass, as from a cart.**

Webster

In today's sophisticated data processing environment the memory dump remains as an absurd anachronism. Abend-Aid is a software system designed to deal with the problem of abends and the associated memory dumps.

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## NO

- Abend-Aid is not a dump formatting package.
- Abend-Aid does not require any JCL changes.
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# House Scraps Rewrite, Begins Amending Act

By Jake Kirchner

CW Washington Bureau  
WASHINGTON, D.C. — Shelving its attempted rewrite of the Communications Act, a House of Representatives subcommittee has turned to the task of amending the telecommunications provisions of the 1934 law.

The House Communications Subcommittee, under the chairmanship of Rep. Lionel Van Deerlin (D-Calif.), plans to have its common carrier amendments ready for introduction as a separate bill by the end of this month. The subcommittee will begin

"markup" — final revision — of the new bill when Congress returns Sept. 5 from its month-long summer recess.

Van Deerlin hopes to have the narrower legislation passed by the full House before the end of the year, according to a subcommittee spokesman. The new bill will be basically a final version of Title 3 ("Telecommunications Carrier Regulation") of the original rewrite measure introduced by Van Deerlin.

The thrust of the new legislation was presaged in a recent letter from Van Deerlin to his subcommittee colleagues in

which he called for a restructuring of AT&T that would mandate separate subsidiaries for competitive services while allowing the company to maintain its present corporate structure for basic telephone services.

Van Deerlin's compromise proposal has been received well but not enthusiastically by AT&T and by Bell competitors which have sought divestiture of the firm's Long Lines, Bell Laboratories and Western Electric components.

## Members Uncomfortable

The decision to abandon the full rewrite attempt came two weeks ago, when the subcommittee met to hammer out the final version of the legislation. Several members of the panel reportedly were uncomfortable with the broadcast provisions of the bill, which have aroused a great deal of controversy among representatives of the broadcasting industry and consumer protection organizations.

"I think there was also some concern on the part of the [subcommittee] members about what they called the 'vehicle' of the legislation, and by that they meant whether they would be voting on new, comprehensive legislation or whether they would be voting on amendments to the '34 act," one subcommittee aide said.

"Several of them expressed the view that they personally felt more comfortable amending the '34 act than they did voting on brand new legislation," the aide added.

Faced with that situation, Van Deerlin and Rep. James T. Broyhill (R-N.C.) and Rep. James M. Collins (R-Texas), ranking minority members of the subcommittee, agreed to move forward with the telecommunications amendments and scrap the full rewrite effort.

"The telecommunications carrier issues are the ones on which immediate action is imperative," they told their colleagues in a July 13 memorandum. "This is a position shared by the Senate leadership, the Administration, the Federal Communications Commission (FCC), the private industries involved and labor and consumer groups."

## Senate Seeking Compromise

The Senate Communications Subcommittee completed hearings June 28 — the same day as the House panel — on two bills that would amend the 1934 act.

The Senate committee is reportedly trying to reach a bipartisan compromise between the bill introduced by Subcommittee Chairman Sen. Ernest F. Hollings (D-S.C.) and that co-sponsored by Re-

publican Senators Barry Goldwater of Arizona and Harrison Schmitt of New Mexico.

## Closed Sessions

Meanwhile, the House subcommittee members and staff have met for several closed "discussion sessions" on the proposed reworking of Title 3 of Van Deerlin's bill into separate legislation. The chairman's AT&T structure proposal is thought to be a major topic of discussion.

Van Deerlin proposed that AT&T be required "to form a separate subsidiary or subsidiaries for the provision of competitive services and products. It would at the same time permit the continued working relationship between the Bell operating companies and independent telephone companies for the provision of Message Telephone Service (MTS).

"The basic network would consist of the facilities provided by Long Lines and the Bell operating companies. The only service which could be offered as a joint service by the network would be MTS with certain basic enhancements. The FCC would be given the authority to decide whether an enhancement was permissible or whether such enhancement constituted a competitive offering which should be made by the subsidiary."

Van Deerlin continued: "While MTS is the only service that could be provided directly by the network, the network would be able to provide facilities for other services, including private line ... and enhanced data services such as

the proposed [Advanced Communications Service].

"However, these services would have to be made available through the competitive subsidiary, and any facilities provided to a subsidiary would have to be made available to others, including users and competing carriers, on the same rates, terms and conditions."

## Plans for Subsidiaries

According to the proposal, "the subsidiary or subsidiaries would be fully separated from the other AT&T affiliates by the requirement that it have a separate board, separate books and accounts, separate marketing and maintenance division and by a prohibition against owning or operating any facilities jointly with any other affiliate as well as other safeguards."

Competing carriers "would have access to the facilities of the network and could obtain facilities not being made available to the AT&T subsidiary upon a showing to the FCC that such facilities were not available otherwise."

Western Electric, AT&T's manufacturing arm, would have to establish separate divisions for sales in the regulated and unregulated markets.

Bell Labs would be similarly divided, under the Van Deerlin proposal, in that a separate accounting structure "to reflect work performed for the regulated and unregulated divisions of Western Electric" would have to be set up. And "any work performed for the competitive subsidiary would have to be on a contract or direct cost basis."

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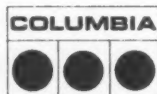
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## Programming Taught After Hours

# Fireman's Fund Wets Down Training Costs

By John Whitmarsh

CW Staff

SAN RAFAEL, Calif. — Fireman's Fund Insurance Companies here has developed an after-hours training course for programmers that has lowered the company's training costs and increased its employee retention rate.

While the course was designed to suit the specific needs of Fireman's Fund and its growing 624-person DP department, the approach is adaptable to almost any organization, according to Mike Scimeca, the company's director of DP and systems training.

The course is intended for entry-level programmers and is definitely not for the unmotivated. It crams in more than 600 hours of class time and is conducted after hours twice a week for 44 weeks. Those who graduate are guaranteed a programming job, but not necessarily upon completion of the course.

"It's a grueling year," Scimeca said. "Students have 12 to 15 hours of homework a week and at some points in the course spend most of their evenings and weekends working on programming assignments."

The program is extensive and covers:

- Structured program design and coding techniques.

- Editing techniques.
- Calling subroutines.
- The processing of two transaction files against a master file.
- Sorting.
- Level break concepts.
- Indexing and subscripting with three levels.

- Vsam, MVS concepts, JCL, MVS core dump analysis, TSO, Superwylbur and selected utilities.
- Fireman's Fund standards and procedures.

Students write, debug and run 12 programs, each of which requires 20 to 100 hours to develop. They develop their own logic for all but the first two programs, and the programs are critiqued for quality of design and code.

Students learn on the same Computer Optics, Inc. 8277A terminals at night that experienced programmers use during the day. The terminals access Fireman's Fund's two IBM 3033 mainframes and its IBM 370/168 multiprocessor.

"I firmly believe you are better off training people on the equipment they will use," Scimeca said.

### In-House Instructors

For Fireman's Fund employees only, the course is both voluntary and free. However, the course costs the company \$1,350 per trainee, including computer time charges, the cost of pre-selection aptitude tests and related salaries. Students are not paid for attending the class, which keeps costs down, Scimeca said.

Course instructors are full-time employees of the company's seven-person training department. Those who teach at night as well as during the day are compensated at a rate comparable to that given evening class instructors at local community colleges.

"Developing trainees requires an extremely experienced instructor," Scimeca said. "Many corporations make the mistake of hiring a recent com-

puter science graduate to teach their students, but that person cannot impart experience because he doesn't have any.

"Both my instructors have extensive programming experience, and that's critical for the trainees."

### Graduates' Success

How is it working? Two classes have graduated so far. Of the 28 people who qualified for the first course, 20 were selected to take it and 18 graduated. Thirty-six people qualified for the second class, 24 were selected and 20 graduated.

Applications for the program have continued to rise. Forty-two people

qualified for the third class, now in session, and 55 qualified for the class that begins next March.

The company holds two classes per year, one starting in March and one in September. New graduates are there-

grams run by his department, and early statistics back him up. Of the 38 graduates in the first two graduating classes, only one left Fireman's Fund, and that was for a nonprogramming position elsewhere.

Fireman's Fund had tried a variety of full-time training curricula ranging from six-week self-study courses to a 16-week class, but each attempt had the same result.

"The end product was good, but the courses were expensive," Scimeca said.

In addition, scheduling was sporadic because classes could only be conducted when the company could not meet its recruiting goals from outside

(Continued on Page 18)

## Human Connection

fore available for programming jobs every six months.

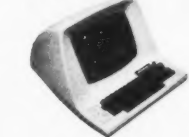
Scimeca says the retention rate of programmer graduates will probably be above the average for other pro-

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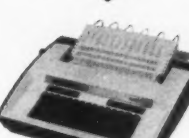


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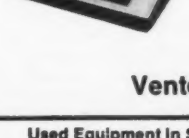
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# Unity Gives Florida Educators DP Buying Clout

By Jay Woodruff

CW Staff

TALLAHASSEE, Fla. — Any equipment buyer would like to get discounts, especially if the buyer is a school district on limited funds.

The State of Florida Department of Education is in the enviable position of having the buying power of a large corporation because all purchases must have the approval of the state's Commissioner of Education.

The total DP budget for the state's university system, community colleges and school districts easily exceeds \$40 million. About half of that figure goes toward hardware and software, according to Sharon Meridith of the Florida Educational Computing Project (FECF).

As the commissioner's eyes and ears for computer-related acquisitions, the FECF's four-member staff screens all DP-related purchases totaling more than \$6,000 a year before the commissioner approves them, according to

FECF Director David L. Brittain.

Recently, Digital Equipment Corp. gave a discount of 11% on 19 computer systems including PDP-11/30s, 70s and 74s.

IBM allows a Florida school district that has leased equipment, with payments accruing toward eventual purchase, to sell it to another district in the state without losing the accrual.

"If someone in Miami has a system he wants to replace and has paid 75% of its value, he can send the machine to another part of the state without losing the accrual, allowing the taxpayers' money to be used anywhere," Brittain explained.

"No other vendors do this, but it's only with a large company like IBM that the monetary effect of the arrangement is so great," he said.

Software houses discount their products heavily for state-wide purchases. Management Science of America, Inc. gives discounts of 30% to

50%; Pansophic Systems, Inc. gives 10% to 25% off, depending on the number of packages purchased; and Informatics, Inc. gives discounts as

high as 50%, Brittain said.

FECF also exercises a lot of clout when it comes to contracts and services. Since all purchases are approved

through the Commissioner of Education, there is a greater incentive for vendors to fill contracts and service obligations on time.

## Soviets Install Air Traffic Control

MINERAL'NYJE VODY, USSR — A computer-based air traffic control system has been put into operation and officially inaugurated here, in anticipation of the 1980 Olympics.

Mineral'nyje Vody, situated midway between the Black and Caspian Seas in a popular vacation and recreation area, has a "highly intensive" flow of air traffic, according to Industrial News Service of Solna, Sweden.

The air traffic control system is based on Sensor 932 computers from the Swedish company Datasaab AB, including one machine on permanent standby in case of system failure. The system also includes 16 operator positions equip-

ped with display systems for radar data and flight plans.

The total worth of the order amounts to approximately 320 million Swedish crowns (equivalent to \$72.8 million). The entire system was supplied on a turnkey basis by the IDS Di-

vision of Datasaab, located near Stockholm.

The contract marks the first time the Soviet civil aviation authorities have engaged a non-Soviet supplier for such equipment, the news service reported.

## Symposium Head Named

CLEVELAND — An economist for the Alcan Aluminum Corp. here has been named president of the 13th Annual Simulation Symposium.

Harvey Fisher will direct planning for the conference, which will be held in Tampa, Fla., next March. He is a member of the National Association of Business Economists and the Institute of Management Science.

The symposium that Fisher will head is designed to provide a place where attendees can exchange working experience. It will include instruction on computer simulation and modeling.

The symposium is sponsored by the Association for Computing Machinery, the IEEE Computer Society and the Society for Computer Simulation.

## The greatest improvement in DEC's PDP 11/34 isn't made by DEC.

It's made by National Semiconductor. Memory specialists, and manufacturers of the new NS11Q.

It's an add-in memory that manages to put 256KB and a built-in parity controller on a single card.

Since the on-board parity eliminates the M7850, the NS11Q boosts throughput and saves you two slots at the same time.

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PDP 11/34 is a trademark of Digital Equipment Corporation.

## Training Costs Cut

(Continued from Page 17) the company. Advancement for company employees was a matter of timing and chance.

"Beyond all that was the problem of finding suitable jobs for each graduate. We long ago learned that the first assignment given is critical to the retention and development of a trainee," Scimeca said.

### Selection Process

Recruiting is limited strictly to Fireman's Fund personnel who have worked for the company for at least one year in any capacity. During a series of lunch-hour recruitment meetings, the company describes the selection process. In addition, a graduate of the course speaks about the personal commitment required to complete the training.

Each candidate takes a job-related aptitude test. The final selection is based on those test results, on interviews with DP and training executives and — a valuable consequence of the "employees-only" approach — on relevant information from the candidate's personnel records.

"The end result is that a very high percentage of our students graduate and compete favorably with 'street hires' with up to one year of experience," Scimeca said.

### Another Benefit

One other benefit: The course is worth college credit. Scimeca said the course has received a credit recommenda-

tion for nine units of lower division and one unit of upper division work in computer science or DP from the American Council on Education in association with the consortium of the California State University and Colleges.

"At the completion of the course, graduates are guaranteed positions in a professional field," Scimeca said. "We think that's a far more attractive path than several years of night school with no job guarantees."



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# "We switched to an NCR system because we were growing fast," says John F. Schafer of Harrison Western Corporation.

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**SCHAFER:**

Right. We had been using our old supplier's largest minicomputer, so we had no system to grow to. We needed additional programs for general accounting applications. We were under pressure. So we began looking for another vendor with a broader base of available software.

**NCR's TILLMAN:**

And you found the NCR 8200 and Migration Path Engineering.

**SCHAFER:**

We selected NCR because the 8200 gave us greater hardware capability at the same price we had been paying. We also acquired the software we needed for our key applications — construction scheduling and cost accounting. And for the general accounting applications as well.



John F. Schafer (right) is data processing manager of Harrison Western Corporation, Denver, Colorado. George Tillman is an NCR district manager.

**NCR's TILLMAN:**

I recall that the transition went very smoothly.

**SCHAFER:**

I have been in data processing for 20 years and I know how difficult conversions can be. Our last two conversions — to the 8200 and, later, to the NCR 8350 — were the easiest I have ever seen. We unplugged the 8200 on a Thursday and the 8350 was up and running on Friday.

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## Preconference Tutorials Scheduled for Compcon

WASHINGTON, D.C. — Three preconference tutorials will be presented here on Sept. 4, the opening day of Compcon Fall '79.

The four-day conference on "Using Microprocessors — Extending Our Reach" will start at 9 a.m. with a session on "Design of Microprocessor Systems." The session will examine the range of available microprocessor products and development tools.

The second tutorial "A Practical View of Computer Communications," will emphasize design and protocol choices and the offerings in these fields.

"Microprocessor Project Isaacson to Chair Compcon Fall '79"

SILVER SPRING, Md. — Dr. Portia Isaacson, who chaired the 1977 National Computer Conference in Dallas, will chair the IEEE Computer Society's Compcon Fall '79.

The conference will be held Sept. 4-7 at the Capital Hilton in Washington, D.C.

Isaacson, a co-owner of the Dallas area Micro Store and president of the Computer Retailers Association, is technical editor of *Computer Magazine*.

The conference will explore the latest developments in microprocessor architecture, support software, operating systems and peripheral devices, as well as applications.

Papers and tutorials for the conference are invited. More information is available from Compcon Fall '79, P.O. Box 639, Silver Spring, Md. 20901.

Management" will take the experiences of hundreds of project managers and form them into a methodology for managing all phases of a microcomputer application.

More information on these tutorials and the rest of Compcon '79 — set for the Capitol Hilton Hotel here — is available from Compcon Fall '79, P.O. Box 639, Silver Spring, Md. 20901.

## DPMA Sets Early-Riser Sessions

SAN DIEGO — Two early-riser sessions on corporate information management will be held during the Data Processing Management Association's (DPMA) 28th international conference and business exposition here Oct. 14-17.

These sessions will be held from 7:30 to 9 a.m., a spokesman said.

On Monday, Oct. 15, the first early-riser session will detail a six-step plan to help the information system processing manager enter the 1980s by reducing management information service (MIS) costs. Entitled "Less Mess in MIS: A Diet Plan That Works," the

session is expected to challenge established concepts in MIS development.

Tuesday's workshop, "Successfully Managing the Source of Corporate Information," will explain responsibility for corporate data in a nontechnical manner.

A variety of seminars with everyday applications will be presented during the conference.

Program details and registration forms for the conference — to be held here at the Town and Country Hotel — can be ordered from the Conference Coordinator, DPMA, 505 Busse Highway, Park Ridge, Ill. 60068.

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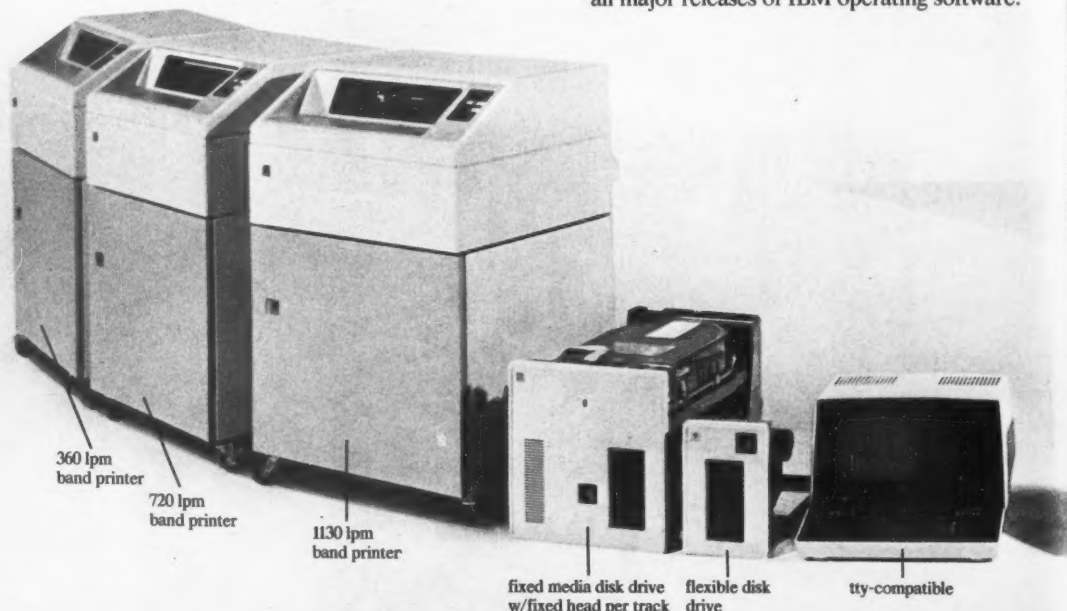
"Now you can add up to 240 Mbytes of removable storage with our Storage Module Drives. Their popular format attaches to the Series/1.

"Our Certainty line printer that gives you clean, crisp printing at 720 lpm and more. It can also cut your paper usage by 30% when you use its compressed pitch option.

"Our display stations eliminate the need for expensive video cabling. Certainty display stations use low-cost digital cabling. So you can put your terminals where your people are — up to 4,000 feet from the cpu.

"Controllers? No outboard controllers, because we incorporated all controllers and interface logic into our hardware. And we engineered Certainty Series around the Series/1 architecture, retaining the important cycle steal feature. All of these products are ready right now to be plugged into the Series/1.

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# Monitoring System Eases Strain on Power

By Tim Scannell

CW Staff

CAMBRIDGE, Mass. — Squeezed by rising fuel prices, limited supplies and increased power demands, utility companies usually pass the overall cost burden onto the consumer.

However, by taking advantage of a computer-based, two-way energy monitoring system developed by a research firm here and already

implemented in a number of power plants across the nation, the consumer can fight back.

American Science & Engineering, Inc.'s (AS&E) Asep Load Management System allows utilities to charge their customers according to time-of-day or peak rates by continuously monitoring energy use within each household. Communicating over the power lines themselves, the

system can check individual utility meters as often as every 30 minutes or as infrequently as once a month, according to Ralph Abbott, vice-president of the more than 20-year-old company.

That means consumers can save money by not using washing machines, air conditioners and water heaters until the evening or weekend, when power demands are at a minimum. "The [fuel] savings that

the utility would enjoy will translate to the consumer through the rate-making process . . . into a cost savings," Abbott observed.

## Remote Control

Because Asep is a two-way system, however, the power companies can also remotely control certain noncritical customer appliances, such as electric hot water heaters, and are capable of turning off whole

blocks of nonessential power loads when usage reaches dangerous levels. The system can therefore help avert crippling brownouts or blackouts that occur during strained peak periods.

"The average consumer will never know it's happening," Abbott said. The system in "no way impairs the quality of the service to that customer . . . and yet it's a significant benefit to the utilities."

He noted that power companies could offer annual rebates of \$18 to \$24 to each consumer who submits to limited utility control.

## Eight Utilities Have It

The power monitoring system is installed in both receive-only and limited transmit modes in about eight power companies across the country including the Florida Power and Light Co., San Diego Gas and Electric Co. and the Jersey Central Power and Light Co.

The largest full-scale two-way system in the world has been installed by the Wisconsin Electric Power Co. in Milwaukee. There, 450 customers are participating in the control pilot program and about 800,000 other users have their meters read continuously.

The load management system is centered around a Data General Corp. Eclipse minicomputer with 96K bytes of core memory. Peripherals vary but basically include a couple of 10M-byte disk drives, a 1,600 bit/in. magnetic tape unit, a CRT and a 300 line/min printer.

The minicomputer is tied via telephone line to each of the utility's distribution substations that receive power from the plant's main generators and dilute it for public use, Abbott explained. To control a household's power usage, the

(Continued on Page 22)

# line of miniperipherals even more attractive."

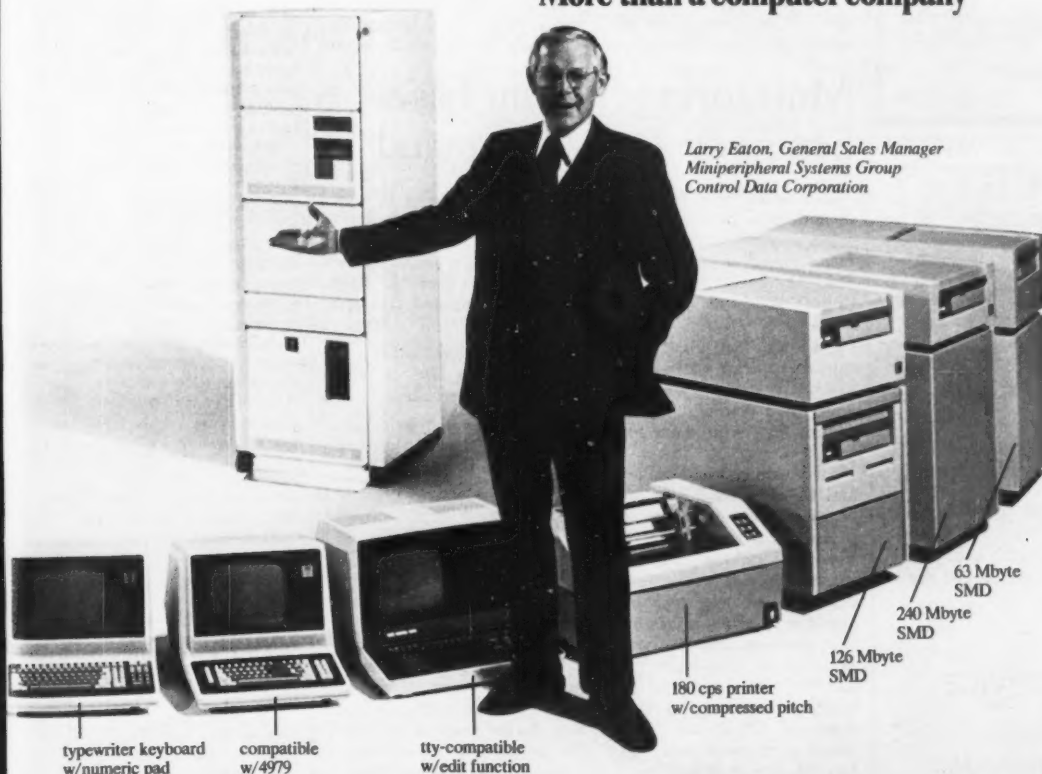
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# CPU Schedules Track Events in Record Time

By Jay Woodruff  
CW Staff

MACOMB, Ill. — A computer that knows all the rules is making it easier for Western Illinois University (WIU) to organize and run the annual Division II track meets of the National Collegiate Athletic Association (NCAA).

The school uses the computer to drastically cut the amount of time once needed to assign about 600 athletes to the preliminary, semifinal and final heats of more than 20 events according to the rules of the "NCAA 1979 Track and Field Guide." What once took the better part of a day now takes just a few hours.

The system replaced a tedious process in which coaches on the Games Committee spent long hours shaking

numbered "peas" out of a jar to get random assignments for the competitors.

The system also keeps track of each school's and each competitor's progress through the meet, according to Dennis Werling, who spent two years and more than 500 hours putting together nine Cobol programs to automate the contests.

Werling, himself a competitive marathon runner with a time of 2:41:46, did the programming in his spare time. The system has been used at NCAA meets held this year and last at WIU.

The system has worked so well that NCAA officials are examining it for use in more of its contests, including its Division I finals, which are held one week after the Division II

finals at the end of May.

Before the advent of the computer, organizing the order of the contests was easily the least exciting part of the entire meet. On the day before the competition, teams and coaches would arrive at the game site and "declare" the athletes who would compete and the events in which they were going to compete. It was up to the nine coaches making up the running, jumping and throwing committees to assign each competitor to one of the preliminary heats of each event.

Coaches were not eager to serve on the committees because it took them away from their teams well into the evening, WIU track coach Jim Sackett recalled.

Once the assignments were made, secretaries worked that night to type up assignment sheets, which were copied and handed out to the competitors, their coaches and the press before the competition began.

Last May, by contrast, WIU hosted the Division II finals, the coaches handed in their declarations by noon and got the "heat sheets" just a few hours later. All the work was handled by a 2M-byte IBM 370/155 mainframe.

The only work left to the Games Committee now is to pass judgement on whether a competitor declared by a coach is qualified to compete in the finals, Sackett said.

## Program Vaults Hurdles

The automation of the contests began five years ago, when Sackett faced the task of

organizing 2,000 athletes who were invited to an annual high school invitational meet at WIU. Talking to Ron Goodman, the university's assistant director of computer services who often works as an official at athletic events, Sackett found out that the school's computer might be enlisted to help organize the competition.

Later, when WIU applied to host the NCAA Division II contest, Sackett and Goodman asked Werling if he would be willing to assemble a program for the games. Werling accepted, but soon found that the NCAA rule book presented quite a hurdle to computerization.

"The rule book was not made for use on computers," he explained. For nearly all events, the rules change as competitors progress through the preliminaries to the semifinals to the finals. The programs must reflect all of the changes.

In the 440-yard dash, for example, the runners in each of four heats must be split up so each heat contains a cross-section of the available competitors, from the fastest to the slowest. Then each runner is randomly assigned a numbered position on the track.

The rules state that no heat can have two competitors from the same school. If this occurs in the random assignments, the coaches have to swap the slower athlete with one from another school who has similar time.

Often the coaches create another duplication in making the swap, so the process must

be repeated until the field for each heat complies with the rules.

For the semifinals, the two fastest runners must start in the two middle lanes, with the second two fastest on the outside lanes.

In spite of the amount of time Werling had to spend — "He worked like a horse," Sackett said — the computer proved its worth this year when a top-ranked team from Baltimore's Morgan State University failed to show up Thursday morning, the first day of the Division II competition.

Since the team contained defending champions in some of the events, the computer had placed them prominently in each heat. The entire program had to be rerun.

Werling ran over to the computer center, deleted Morgan State from the schedules and had the CPU redraw them. They were then delivered to the competitors, coaches and press 20 minutes before the games began.

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## Monitoring System Eases Strain on Power Demand

(Continued from Page 21)

computer is programmed to inject a predetermined command signal into the power line; the signal is received by a preset device at the user's home.

The signal tells the device to turn on or off a water heater, air conditioner or other appliance for a predesignated period of time or until the peak period passes.

The power company collects and stores usage information on each household by accessing a transponder, fitted between the utilities meter and the meter's socket. The power data is then sent back and stored in nonvolatile memory.

"In the event there is a power interruption, [the utility] has all this stored revenue metering data in an electronic memory," Abbott said. "If the power goes away, you won't lose that accumulation."

Although the concept of power line communications and remote appliance control

is relatively new — it took AS&E a few years to progress from the prototype to the production stage — recent developments are causing more people to sit up and take notice.

"What really brought it to a head was the last oil embargo," Abbott recalled.

Recent federal regulations, pressures by the Organization of Petroleum Exporting Countries and President Jimmy Carter's recent pledge to cut the import of foreign oil nearly 50% by 1980 have also forced the power companies to search for more cost-effective ways of producing energy.

While the system hasn't experienced any insurmountable technical problems, there has been a little political and "human factor" resistance over the principle of being controlled in any fashion. However, customer support has been better than 80%, Abbott claimed.

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# To Set Policy Until End of Century Upcoming Communications Meet Worries U.S.

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — There is growing uneasiness here about the upcoming World Administrative Radio Conference (Warc), which will shape world telecommunications for the rest of the century.

The conference, held every 20 years, controls the international allocation of the electromagnetic spectrum and can modify the international radio regulations, which govern all telecommunications. The 154-member International Telecommunications Union (ITU), a United Nations organization, will convene the conference this September in Geneva.

All global communications, from radio and television to advanced satellite-based data communications services, will be affected by the technical, legal and political decisions reached at the conference. U.S. officials are worried that representatives of the developing nations, comprising two-thirds of the ITU membership, will thwart U.S. goals for the conference.

Sen. Barry Goldwater (R-Ariz.), a member of the Senate Communications Subcommittee, told his colleagues recently he is "concerned with the growing politicization of the ITU as a result of the efforts being made by Third World nations to accomplish political objectives in what has been in the past a forum for technical discussion."

## 'Sabotage' Feared

Goldwater's concerns are shared by leaders of the U.S. Warc delegation. Glen Robinson, chairman of the delegation, told a House of Representatives subcommittee last month he is worried that the conference could be "sabotaged" by ideological rhetoric.

Robinson, a University of Virginia law professor and former member of the Federal Communications Commission (FCC), was considerably more pessimistic at the June 14 hearings than he had been at hearings in April.

In addition, a study prepared by the Library of Congress at the request of Goldwater and Sen. Harris Schmitt (R-N.M.) said: "The official U.S. approach to the . . . conference could be characterized as one of cautious apprehension. There has been a change in public stance since early May; until that time, Department of State officials, especially U.S. Warc delegation members, had been expressing a degree of optimism."

The study, conducted by the library's Congressional Research Service (CRS), warned that Third World opposition to U.S. proposals "may prove a considerable challenge to U.S. policymakers and representatives."

"In the areas of international communications, the Third World has voiced a number of grievances under the general heading of the 'new world information order.' These concerns include a more 'balanced' flow of information between North and South; the prior consent of governments before their people are exposed to foreign 'propaganda' or cultural influence (in anticipation of the future development of direct broadcasting by satellite); and the demand . . . that portions of the increasingly crowded spectrum be re-

served for developing countries that might not be able to use it until some unspecified future time.

"Only the latter issue could legitimately be considered an item on the Warc '79 agenda," the report noted, "but the others will nevertheless also probably be raised in general debate."

The 1979 Warc will, in this regard, be a vastly different conference from the 1959 meeting which, according to Wilson Dizard, vice-chairman of the 100-plus-member U.S. delegation, was "basically an agreement among industrialized countries." According to Dizard, the U.S. position is that the spectrum should be allocated for services and not to individual countries.

The State Department, the Commerce Department's National Telecommunications and Information Administration and the FCC were the primary focuses of extensive discussions between U.S. officials and telecommunications industry representatives that led to a 406-page U.S. Warc proposal document. The proposals were submitted to the ITU in January.

According to Dizard, the U.S. proposals will constitute a working paper for the conference and probably be the basis for Warc deliberations, scheduled to run from Sept. 24 through Nov. 30.

Stating that the U.S. delegation is not totally pessimistic about the conference's outcome, the CRS study

noted that "the guiding maxim of the functioning of the ITU has always been cooperating. Barring an unmanageable epidemic of politicization in Geneva later this year, it is possible that such an atmosphere might again prevail."

The report added: "The UN apparently still assumes that there will be little East-West conflict at Warc because the major world powers — the United States, the USSR and the People's Republic of China — are in basic agreement on the means by which the spectrum is managed because it is to our mutual advantage that the ITU, a truly global agency, function efficiently and with relatively little friction."

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## EDITORIAL

### Cheap Mass Storage

In the coming decade, breakthroughs in mass storage technology are likely to make the creation of large, computer-stored data bases economically feasible for many organizations, ending their dependence on cumbersome manual storage methods.

The drop in mass storage cost is likely to have profound social effects. The most conspicuous of these may be measured in terms of higher economic productivity, but important, if more subtle, ramifications can also be expected in the political realm.

After all, to paraphrase an old aphorism, information is power. In recent years, the Public Policy Research Organization has chronicled the tendency of suddenly implemented, computer-based mass storage to disrupt power balances in local governments [CW, Feb. 12].

Advances in mass storage technology may intensify debates about how data should be managed. An organization's growing capacity to store data about individuals, for example, makes the need for adequate safeguards of privacy all the more pressing.

Video disk technology, which is just starting to emerge from the laboratory, is an especially promising form of mass storage in terms of cost-effectiveness.

North American Philips' Magnavox Government and Industrial Electronics Co. (Magiec) has just released a \$150,000 video disk recorder it claims can store 2 by  $10^{10}$  bits on a dual-sided disk with an error rate that is virtually zero [CW, July 23]. Magiec's price for prototype recorders is expected to be on the order of \$10,000 within two years, and prototype disks will be marketed next year for \$150 each.

According to a Magiec spokesman, the nation's mass storage requirements are "staggering." More than 3,000 large business and scientific computer systems reportedly have on-line memory capacities exceeding 2 by  $10^{10}$  bits, many of them maintaining off-line tape libraries representing more than 2.5 terabits ( $10^{12}$  bits) each.

Each year, the federal government buys more than two million reels of tape to hold more than  $10^{15}$  bits, the spokesman reels.

Video disk developers reportedly expect the banking industry and various government agencies to buy that form of mass storage at least as fast as it appears on the market.

Numerous powerful organizations in the business of filing information about other organizations and individuals seem destined to greatly extend their capacity to do this regardless of whether the potential for abuse of such data can be held in check.

## DATA PAST

### Five Years Ago July 31, 1974

WASHINGTON, D.C. — In what appeared to be a breach of a commitment made by General Services Administrator Arthur Sampson, the General Services Administration requested bids on Fednet last week without notifying members of Congress or the executive branch. Although the move caught everyone by surprise, angry congressmen reacted quickly, framing legislation that five days later effectively killed the proposed federal teleprocessing network.

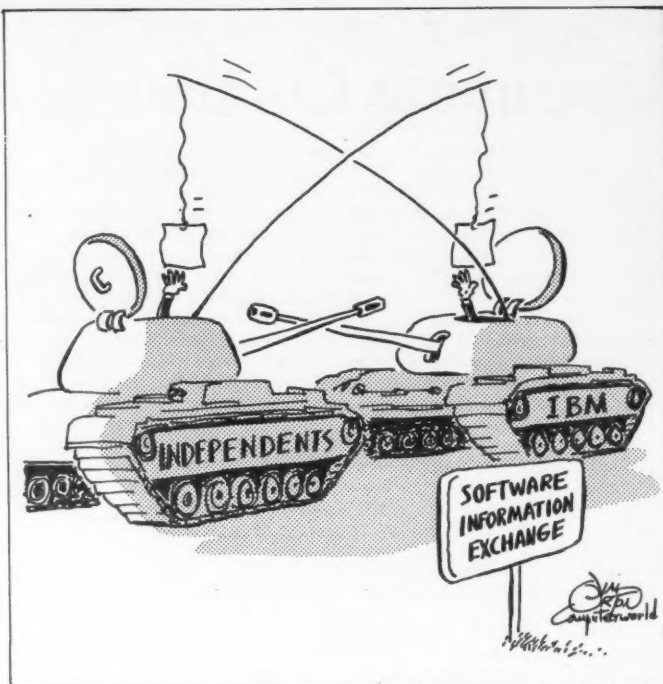
NEW YORK — Despite strong protest from IBM attorneys, Chief Judge David N. Edelstein granted a government request to delay its antitrust suit

against IBM at least 60 days from the originally scheduled Oct. 7 trial date.

### Eight Years Ago Aug. 4, 1971

WASHINGTON, D.C. — The Post Office Department's computerized management information system (MIS) cost more and was less useful than previous manual systems, according to the General Accounting Office.

CAMBRIDGE, Mass. — Harvard and MIT killed their joint IBM-funded, \$5 million inquiry into the impact of computer technology on society. Apparently IBM found the program too academic, Harvard found it not academic enough and outsiders found it irrelevant.



## LETTERS

### Armonk Turkey Shoot

The great "Armonk lottery" should be named the great Armonk turkey shoot.

IBM's "first-day order" system does not require any commitment from the customer. A statement saying, "I think I may want a 4331 and/or a 4341" will enter a company into the lottery. To enter the turnkey shoot, you must state, "I think I may want a dozen 4331s and/or a dozen 4341s." You may cancel at any time prior to delivery, so it makes sense to order more than you need and then cancel the bad delivery dates.

I am sure there is a great demand for the 4300 systems, but who really knows the extent of that demand?

Larry T. Collins

Indianapolis, Ind.

Companies like CW Communications should lead the way and not make excuses.

Donald E. Weimer

Babylon, N.Y.

### CW Unfair to NRA

"Computerized Mailing Lists Pick Wrong Target" [CW, July 16] accused the National Rifle Association (NRA) of soliciting convicted, incarcerated murderers for membership. Rules of the organization prohibit persons convicted of violent crimes from holding membership, but the article stated that such felons are regularly solicited, if only accidentally, and implied that these solicitations might be deliberate.

The NRA counts among its past and present members five or six U.S. Presidents, thousands of officers of the armed forces, generals to lieutenants, and police officers; and such experts as ballistic specialists, gunsmiths, metallurgists, toolmakers and stockmakers, in addition to millions of veterans. It is doubtful that such an organization would deliberately cater to or solicit convicted, violent felons for membership.

CW also accused the NRA of being a lobby. Organizations that lobby must register, and the NRA is not required to be registered. It is, in fact, not a lobby. It looks as if CW missed again. It just goes to show how dangerous a misaimed pen can be in the hands of — oops, there goes another burst: "ZAC ^C\$5\$0."

Michael P. Maurice

Portland, Ore.

### Stop Junk Mail

I disagree with *Computerworld's* editorial justification for mailing CW subscription literature to current subscribers [July 9]. This is truly junk mail at its worst and could easily be stopped.

The editorial implied the direct mail business is unethical by saying matching was impossible for fear of theft of the mail lists. I'm sure honest direct mailers are in the majority. Various methods are available to safeguard lists (including dummy names), but the best method is to patronize reputable firms.

Alan Taylor did an excellent column several years back on mail list matching, so technical problems should be minimal. With the costs of printing and mailing ever increasing, matching should be a welcome and easy way to get more "bang for the buck." As these lists are leased on a per-name basis, a matching plan could compensate based on the usefulness of the lists — higher amounts for new names and lower (or no) payment for duplicates.

*Computerworld* welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters should be addressed to Editor, *Computerworld*, 797 Washington St., Newton, Mass. 02160.



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## HUMAN CONNECTION/Jack Stone

# Has Age of Systems Incompetence Begun?

On the morning of Skylab's descent, while pondering whether its "footprint" would stomp on my head, it occurred to me that we DPers who are involved in business systems never had it so good.

When our systems go awry, the worst that usually happens is that some consumers become irate or internal users suffer frustrations or top executives go on the rampage. Sure, the consequences may be serious at the business operations level, but they are

peanuts compared with system foul-ups that result in radioactive atmospheric contamination or an engine separation on a commercial aircraft or showers of man-made meteorites.

Based on recent history, one can't help wondering if maybe the technologies of very large complex systems — in business and many other fields as well — have finally moved beyond our collective capabilities to manage and control them. I was reflecting on this question, trying in my mind to trace

some sort of history, when I happened to note a letter to the editor of the *New York Times* for July 11 — Skylab's doom day, you may recall — which constructed the history for me. The story was presented so artfully that I wanted to share its highlights with you and relate some conclusions relative to our business.

The letter was written by Sid Taylor, research director of the National Taxpayers Union, located in Washington, D.C.

"It all began with the electric power network blackout in New York. The system failed and the lights went out.

"Since then, we've had the Teton dam collapse, the billion-dollar swine flu flu-fiasco, Detroit recalling millions of autos for defects, mass transit blunders . . . and fraud or incompetence in government programs . . .

"Then along came the nuclear reactor breakdown at Three Mile Island . . . the DC-10 jumbo jet tragedy . . . and the Alaskan oil pipeline leaking again. I'm beginning to worry about our proposed \$30 billion MX missile system. With 2,000 nuclear warheads running around on railroad tracks in 4,000 miles of hidden trenches . . . how will we control, inspect and detect malfunctions in this system? I hope it's not turned over to the Nuclear Regulatory Commission or the Federal Aviation Administration.

"Have we entered a new age of incompetence? Are Murphy's Law and the Peter Principle about to destroy us? Even Skylab, which was programmed to stay in orbit for 10 years, is coming back four years ahead of time because of certain miscalculations . . . but nobody knows exactly where. Let's hope it doesn't hit the reactor at Three Mile Island.

"New-technology, high-performance systems create massive risks. Today's management profession is about 25 years behind space age technology. We taxpayers can no longer afford faulty designs, shoddy engineering, overly complex and defect-ridden networks

(Continued on Page 26)

## READER COMMENTARY/George M. Carpenter

# Programming Valuable to Inmates

The nature of our social order seems to include the periodical "retail" of incarcerated individuals. In the past, the inmate has found himself in a paradoxical situation; when he is doing his "time" by keeping a low profile and not becoming involved in the various programs offered by the system, the inmate is not trying to improve himself.

When he becomes involved in the different programming aspects of the institution, while holding a low profile, he is thought of as merely "gaming" and looking for a way out of prison (the general consensus seems to be that a man should not work for release, but become satisfied with indefinite incarceration, instead.)

Now, we have been given yet another paradox, making the penal process a

tain a positive direction in our lives, we must possess a marketable skill. The DP training we receive here allows us to acquire that skill and can help us become a functioning part of our social order.

Since the inception of our DP training program, we have educated more than 200 convict-programmers. Of that number, only 17% have returned to prisons (so far as we know).

None of those returning to prison were involved in computer crimes. In fact, they were returned for the violation of their respective parole conditions. To our knowledge, none of our people have ever written a program that was used to steal from someone. Neither has any convict-programmer ever been approached to write such a program to be used by another . . . so far as we know.

Our technical training is rigorous and we learn various computer languages including Fortran, Cobol, RPG, Neat/3 and job control languages from IBM and Honeywell. Upon satisfactory completion of the classroom training (which takes 12 months and includes a systems analysis module), we are placed on a programming "team" and given assignments of writing application programs for the Department of Agriculture.

We write programs for independent users, and our programming techniques are sanctioned and monitored under the strict supervision of team leaders and management staff. Many of the convict programmers go beyond the departmental requirements of keeping current with the computer industry and enroll in college courses to expand their knowledge in DP.

This "summary" would seem rather incomplete if we failed to mention the origin of Ribicoff's attacks on DP training in prisons. As the reader may recall, in 1977, Ribicoff initiated and directed a Senate investigation into federal computer security.

Out of this investigation, very little empirical data was compiled. Here, in essence, is the information the taxpayer received for the expenditure of thousands of tax dollars needed to complete the "investigation":

- Computers are very complex.
- Each convict-programmer has a prison record.
- The Bureau of Prisons provides DP training for inmates and then pays

them the "standard" prison industry wage (fourth grade programmer, 32 cents an hour; third grade programmer, 48 cents an hour; second grade programmer, 64 cents an hour; and first grade programmer, 80 cents an hour) to write application programs for the U.S. Department of Agriculture.

Ironically enough, this information could have been compiled simply by writing a letter to the Bureau of Prisons. Had someone thought of this, perhaps thousands of tax dollars could have been saved in the "investigation."

At this point, we might ask ourselves these questions:

- How did the investigating commit-

(Continued on Page 26)

## THE TAYLOR REPORT/Alan Taylor

# Forth Becoming Hothouse For Developing Languages

Forth is not a computer language, although it is called that by many of the 200 or so programmers who use it and by the vendors of the six or so commercially available "Forth-labeled" systems.

Forth may not stay with the computer community, except as an entry in our history books, for more than a few years, but the computer underground is throbbing with claims that it is the greatest thing since the invention of Fortran and other high level languages.

Forth is practically ignored by the mainstream of computer groups, although its supporters have developed some very effective publicity garnering techniques for their various specific interests and hates.

Indeed, almost everything one can say about Forth can be contradicted with apparently good authority. Yet no one seems to know exactly what it is.

Really there is no mystery. While the majority of the data is confusing, the essentials are remarkably simple. Forth is a hothouse for developing new strains of computer languages; it acts much like a greenhouse.

It is the first of its kind and probably won't be the last. But the languages

that are developed under its care will probably outlive greenhouse, as the vegetables developed in one can be improved in another.

Forth is certain to hold a unique place in computer history, and during the next decade, while the original flourishes as the first and only language development system, the languages and systems that it spawns will be of the greatest interest to all computer users. That is honor enough for any system.

## Application Languages

Forth's attractiveness lies in the fact that distinct applications areas, as diverse as cryogenics and banking, can all have their own language strains developed at remarkably low cost. The basic equipment — the Force-type development systems — is available at prices from \$60 to \$5,000, which really isn't too bad. There is no need to dedicate special hardware, or even to use the type of hardware that will be needed later.

Projects can be brought to the pilot phase economically, and different versions of languages aimed at the same application areas can be grown, im-

(Continued on Page 26)

The author is replying to remarks made by Sen. Abraham Ribicoff (D-Conn.), and reported on by Computerworld [March 26] concerning a Senate investigation of federal computer security. Ribicoff said that some prisoners, in the course of writing programs for the Department of Agriculture, learned to crack Internal Revenue Service codes. Next, they allegedly filed bogus tax returns and received large refunds.

"A man with 25 arrests and 14 felony convictions might be better taught to be an auto mechanic or [learn about] some other worthwhile trade that would not require him to be involved in sensitive financial transactions for the federal government," Ribicoff observed.

"Three-cornered puzzle." According to the ideas of Sen. Abraham Ribicoff. (D-Conn.), when an inmate becomes involved in a DP training program such as that here at Leavenworth, he is just trying to learn a more sophisticated method of expressing felonious behavior.

The implications found in Sen. Ribicoff's statements do, indeed, project a "false image." He seemed to be implying that the federal government is funding white-collar crime through the DP training program here at the institution.

In order to become useful citizens in our respective communities and main-

# Prison Programming Course Not Destructive

(Continued from Page 25)  
tee compile and publish the pertinent information on each convict-program-

mer without being in violation of the Freedom of Information Act? (We find this data has been published on pages

## Forth Becoming Hothouse

(Continued from Page 25)  
proved and compared before the need for any decision as to which is best. The possibilities are certainly enormous for application languages. But the speed at which these possibilities will develop into realities is still not clear and needs investigating.

### History of Forth

The Forth history starts in the early '70s, when a version, now called Mini-forth, was produced by Charles Moore to help control radio telescopes. This was succeeded in 1976 by Microforth, aimed at developing microcomputer software for mainly process-control-type applications. The two versions with their own idiosyncracies continue as separate systems to this day. The final version, as of now, from the Moore stable in Manhattan Beach, is Poly-Forth, which provides facilities for multiple terminal use and has added into its facilities some of the advances that have been suggested in the earlier languages.

Outside the Moore stables, another group of Forth-style systems have appeared. Some, such as Urth at the University of Rochester and IPS in Europe already have respectable usage and are acknowledged by the Forth users

group. Others, such as Converse, apparently have missing facilities which seems to prevent their being extended by the ultimate users, and they have been attacked as not being Forth at all. And yet others such as the Miller Forth for Radio Shack's TRS-80 are so new that they have no track record.

### Many Questions

There are plenty of questions outside the purely technical ones, and the answers are widely separated. What application languages have been developed? Can the Forth hothouse develop a successor to Cobol, and would it be sensible to do so?

Is the use of reverse-Polish notation an essential element in any language development system, or is it simply a historical accident which future development greenhouses will do differently?

The answers to these questions will probably tell us the difference between the computer languages we know today and those that will come along within the next few years.

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79-83 in the book which represents the data compiled during the Senate investigation led by Ribicoff.)

• How can a legislator appoint 28 members of our governmental structure to assist him in the investigation of a "phantom" to the financial tune of thousands of tax dollars without violating trust invested in him by the taxpayers?

• How does one evaluate a training program without personally observing the program as an entity (which includes seeing the people involved and what they are doing)?

• How does one "allegate" under the guise of "investigate" without someone asking for empirical data?

Carpenter is an inmate at Leavenworth federal penitentiary.

## Age of Incompetence Here?

(Continued from Page 25)

and negligent maintenance.

"Happiness is a \$implified \$ystem [sic] that is inspected and audited regularly."

Taylor's last sentence is particularly significant. He is saying that today's large-scale systems may be just too complicated to ensure that system operability and reliability specifications are met, or, at the very least, that end user security and safety conditions are guaranteed.

And, I believe he is further telling us there is a critical step in the process of implementing major systems that has not been properly emphasized, and that is the function of "systems inspection."

I conceive of systems inspection as an action where key user managers along with key DP development managers step through the operations of a new system, just as an ultimate end user would. Whether this end user is a home consumer or industrial laborer or

administrative manager, it doesn't matter. What is important is that the managers see for themselves that the system is operating not only as specified, but is, in fact, useful and practical for the end user.

But systems inspection is something more. It recognizes that humans build systems and humans, bless 'em, make mistakes. Systems inspections should uncover errors of an operation nature that are difficult to spot during the development process. For example, systems inspections should certify that adequate backup exists, manual or automatic, so that users are never left completely high and dry.

I suppose that a systems inspection can be compared to a "systems audit" that is now moving into vogue mode. But what I have in mind is that a senior management team — managers who have the authority and power to affect systems changes promptly — would conduct the inspection.

## NEW LINKS IN THE CHAIN



### Cost-Effective Batch Terminal with Remote Plotting

Combining UPOP Software and the recently-introduced matrix printer results in a new industry leader, a batch terminal that prints or plots, for an astonishingly low cost. As a conventional line printer, 132 print positions output at 300 lpm from your IBM, CDC, or UNIVAC host! In plot mode, rate is 16 1/2 in/minute with resolution of 60 dpi horizontally, 72 dpi vertically.

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## On Knight's Tour

We were intrigued with the algorithm Andy Pauker presented in the July 2 issue ("Strategy Leads to 'Knight's Tour' Solution") so much so that we assigned implementation of his algorithm as homework in an introduction to programming course we are teaching at the University of Washington. That led us to spotting several errors of omission and commission in Pauker's commentary which we felt should be brought to *Computerworld's* attention.

First, a striking error of omission: The algorithm is an old one (attributed to J.C. Warnsdorff in 1823). An excellent description of the algorithm may be found on pages 74-76 of *Fundamentals of Data Structures* by Horowitz and Sahni (Computer Science Press Inc., 1976).

As far as errors of commission, we have some quibbles with Pauker's presentation. His Basic program violates some fundamental standards in program style. For example, in two cases he uses the same identifier to name both an array and a simple variable. This leads to such inscrutable code as: "S(I)=S(I)+A(X(I,X),X),Y(I,Y(Y))".

We also felt that use of a more structured programming language would have allowed Pauker to present a clearer statement of the algorithm.

A particularly confusing line in the text of Pauker's commentary is, "A program in Basic with this strategy takes about three minutes for one solution (Fortran takes about five minutes for all 64)." With respect to what machine? With respect to CPU time or wall clock time?

We ran a Pascal implementation of the algorithm on a Control Data Corp. 6600 and on a Digital Equipment Corp. Decsystem 2020. About 30 seconds of CPU time elapsed on both machines in computing results for all 64 cases.

As a final note, we would like to mention that the algorithm as presented may be improved by precomputing the number of legal moves for each chessboard position and maintaining that data in the array used to represent the chessboard. The overall improvement is by about a factor of 4.

Albert Greenberg  
Richard Furuta

Seattle, Wash.

## Frighteningly Familiar

I'm not surprised that the technical session turnout at the National Computer Conference was dismal.

I don't know who referees the papers submitted, because the judges never give their names, but they seem to be an "in" fraternity of professional paper-givers.

The referees' comments on a paper I submitted entitled "Systems Design for Small Business Computer Applications" were most revealing. They said, "Most of the ideas are already known," and, "This paper would have best fit some commercially based technical magazines or reports five years ago."

I tried to write lightly in the first person for an audience wishing to pick up some ideas "already known" to DP professionals who have been in the field five years or more. Some new users were not even considering computers five years ago.

In short, the NCC is getting exactly what it appears to want in terms of papers.

It's a shame nobody else wants the same thing.

John Davenport  
York, Pa.

## Errors Regarding 'Wylbur'

Darius D. Handrich is entitled to his opinions discussed in "Winning Package Passes Strict Test" [CW, June 25] and we are happy that he is pleased with his decision. However, some of the conclusions drawn by Handrich and implications about On-Line Business Systems, Inc. (OBS) and OBS Wylbur are in error.

Lest readers get the wrong idea, we at OBS would like to explain why we feel that way:

First, Handrich implies that people who are influenced to buy Wylbur because of its lower price will "pay dearly later in maintenance and technical support costs." This allegation is completely unfounded. OBS has always stressed low cost as well as complete customer support as a major benefit of its Wylbur product.

OBS invites evaluators to contact any or all of our 40 installations (current as of June 30), to verify both the quality of our support and its low cost.

Second, Handrich stated, "At the time of the evaluation, we were using On-Line Business Systems' Wylbur." This is not true. American Mutual was using a service bureau which had contracted with OBS to install Wylbur.

This service bureau had obtained the rights to use Wylbur directly from Stanford University. Not only was this not the OBS Wylbur program product, but it also had been extensively modified by the service bureau.

Third, the article implied that OBS is a service bureau selling Wylbur "on the side." This terminology is totally inappropriate and inaccurate today. Back in 1976 our marketing program was just getting started. Today, Wylbur has a separate marketing, administrative and technical support staff at OBS. Wylbur is an integral and increasingly more important part of the future of OBS.

Just this past spring, the first OBS Wylbur User Group meeting was held. The user group will provide for a continuing dialogue between our clients and our technical and marketing group. We believe that this relationship will help make OBS Wylbur even more efficient and cost-effective in the future.

And finally, Handrich implied that the round the clock, seven-day-a-week service and regular classes "are only available from a software company." This is also incorrect. OBS offers complete service and full support, including on-site customer classes.

In summary, OBS invites and encourages all prospective Wylbur users to evaluate current facts, features, users, prices and performance. We believe OBS Wylbur will meet any "strict test" criteria and still prove to be the superior Wylbur product at the lowest cost.

Gilbert Jacobs  
Vice-President, Marketing  
On-Line Business Systems, Inc.  
San Francisco

Handrich's original text did not identify the source of the Wylbur used by the service bureau. CW made the erro-

neous reference to OBS in an ill-starred attempt to help our readers. — Ed.

## Barrier to Conversion

I was astounded to read Aaron Finerman's statement, "I don't think software conversion has served as a barrier to changing equipment" ["IBM Witness Rebuts Damaging Testimony," CW, May 28].

This is a very unusual statement that I find difficult to understand. My personal experience has been that software conversion has always been a major barrier to changing equipment. In fact, a couple of interesting studies have seemed to clarify this.

In an article titled "Guidelines to Software Conversion" by Paul Oliver of the Department of the Navy, Washington, D.C., published in the spring 1979 issue of the *Installation Management Review*, Volume 8, Number 1, Oliver stated that a General Accounting Office publication in September 1977 stated that the annual conversion cost in the U.S. government is \$450 million.

Oliver went on to say, "It is reasonable to assume that the overall cost of software conversion is significant." In the same article, he gave figures of approximate cost of conversion from Cobol to Cobol, PL/I to PL/I, Assembly to Cobol and so on. These conversions cost from 40¢ to \$8 per source line of code.

If one takes some middle range there, even \$2 to \$4 per line of code, and estimates the lines of code in a typical installation, conversion is a major consideration that every DP manager must carefully weigh in his decision-making process.

It would be interesting to know how many DP managers agree with Finerman's comment.

Dr. Gary Carlson  
Provo, Utah

## First, Learn to Write

If technical writing is to succeed as a legitimate and respected field, our professors must continue to parse sentences, and then parse more sentences, and when they begin drawing flowcharts, they must still parse sentences, until writers like Joe Rigo ["Technical Writers Should Study Computer Science," CW, May 28] learn that no one can teach us "how to write good" but they can teach us how to write well!

When writers can write well, they might then study computer science. These will be the technical writers. Until that time, however, these mislabeled "technical writers" are simply nonwriters trained in computer science who are trying to document their work.

Mary L. Kendall  
Minneapolis, Minn.

## False Statement

The June 18 issue contained an article on a new data base management system "DSS-1." The third paragraph began "Cobasy's DBMS specifications limit data structures to those normally described as one-to-many relationships . . . DSS-1 goes beyond that, however, and also supports many-to-many relationships (often called network structures) . . ."

That statement is totally false and grossly irresponsible! For authoritative substantiation of this claim (anyone who knows about Cobasy, would not need any) refer to "Cobasy Data Base Task Group Report," dated April 1971, pp. 58-63 or "An Introduction to Data Base Systems," by Chris Date, which states: "the (DBTG) schema DDL is a language for defining a network-structured data model . . ."

Richard E. Landback  
Detroit, Mich.

*Computerworld* welcomes comments from its readers. Letters should be addressed to Editor, *Computerworld*, 797 Washington St., Newton, Mass. 02160.

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# CPU Unchained

## Intel introduces FAST-3805, the Semiconductor Disk that unleashes the full paging power of IBM CPUs.

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timum transfer rates to 16 Mbytes/second. Choose an overall storage capacity between 12-72 Mbytes.

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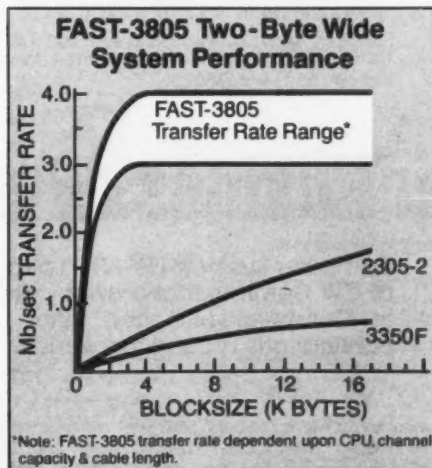
	INTEL	3350F	2305-2
Avg. Seek Time (msec)	0	0	0
Avg. Latency (msec)	0.4	8.4	5.0
Transfer (Mb/s)	1.5-4.0	1.2	1.5
Capacity (Mb/s)	12-72	1	11.2

provides "self-healing" capabilities equal to those specified in the military's highest reliability systems. Additionally, a powerful iSBC™86 single board computer performs continuous sweeping error detection and relocation of data to spare storage, if necessary. The entire FAST-3805 system is supported by motor generator sets to ensure data integrity in case of power fluctuations.

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### BIT 13 (DOING HIS BIT)

Hex and Execute have arrested Dr. Null at Ma Synapse's house in Silicon Valley. Ascii, however, has eluded them. Dr. Null has revealed the shattering news (confirmed by Execute) that Fetch and Simula are having an affair. Hex and Execute are taking Null away, guided by the human girl Cleo, when they hear behind them the dull rumble of the human mob — with Ascii's baying at its head.

Chief Inspector MacRo, the dour Scottish robot commanding the hardware division of the local error squad, was drumming his chromium-plated fingers on his desk. In front of him lay Simula's teletext report and beside it an urgent dispatch from the Data Base Administrator himself. He picked them up and leafed through them again. A speaker on the desk distracted him. "Shall I bring them in?" a voice



## the hexadecimal kid and his faithful dog ascii

A FANTASY  
IN SIXTEEN  
BITS  
by  
Richard  
Forsyth

asked.

"No. Make them wait," MacRo replied.

He rose and began prowling up and down the office, muttering into his beard. It was unprecedented. Never had the humans gone on the warpath like this.

The fact that the arch-saboteur Dr. Null, whom they had written off as dead, was at the center of it all did nothing to improve his humor. He pressed a button. "Send in the trouble-

makers now, but leave the girl outside."

Hex and Execute walked sheepishly into the room.

"Are you the Hexagonal Kid?" MacRo asked.

"I feel like it."

"Answer yes or no only, please."

"I am the Hexadecimal Kid."

"Wait. Before you make a statement, you must put your hand on this black box."

Hex put his hand on the box.

"Do you solemnly swear that you have put your hand, your whole hand and nothing but your hand upon the box?"

"I do."

"Good. Then I'll tell you something

about court procedure in this part of the world. I am judge, jury, witness, prosecutor, evidence, verdict and sentence. There will be no defense. Now then, how do you plead?"

"Not guilty."

"Wrong. Try again."

"Not proven."

"No. One more chance."

"Innocent, Inspector MacRo, sir."

"Don't argue with me, boy, my patience is running out."

"What use is a MacRo without an argument?" Hex asked provocatively.

Seeing stormclouds gathering on the inspector's brow, Execute stepped in. "What are we accused of?" he asked mildly.

MacRo's eyes glinted. "You two have just deserted your post, run amok like a pair of demented humans, kidnapped a young girl, broken into the reservation without a permit, stirred up a revolution among the people and you have the gall to ask what you're accused of."

"But we were acting to protect the System," Hex protested. "Null stole my dog and planned to turn him into a gigotic bomb. That man is a menace to electronic society."

"Your dog is the menace."

"Yes," Hex confessed, "in Dr. Null's hands he is: Ascii can use the privileged system primitives PEEK and POKE."

"And you can't get much more primitive than that," Execute added.

MacRo sighed. "Why couldn't you just send in a report, as Simula did, and leave the rest to us? Now we have to deal not just with Null but with Ascii and the rioters too."

"You know the regulations. The System is based on collective decisions, not harebrained individual initiatives. Your foolhardy escapade has caused chaos."

"You will be punished accordingly. As from today, your modular hierarchy is being restructured: Simula and Fetch will take over as controlling modules and you will be their subroutines."

"In addition, your right of direct access to the Data Base is withdrawn."

"What about Cleo?" Hex asked when the inspector finished.

"She will be sent back to Sprocket's Hole, where she belongs," MacRo replied.

"Sprocket and Bootstrap are degenerates," Hex objected.

"Their lifestyle is a trifle eccentric, I grant you, but they're working for us, and they're licensed to keep her."

"Why can't she be cybernated?"

"She knows too much Fortran."

"Then I want a license to take her with us. Those bandits treat her like dirt."

MacRo frowned. "Let me remind you of something. An unreliable robot can always be reassembled or reprogrammed, but if an android proves faulty . . ." He let the sentence hang.

"Do I make myself clear?"

"Perfectly clear," Hex answered.

"There is an S-100 bus leaving here in an hour's time," the inspector said. "I strongly suggest you two get on it."

After their ride, as they trudged wearily up the hill to Base 16, Hex said: "It doesn't feel like coming home."

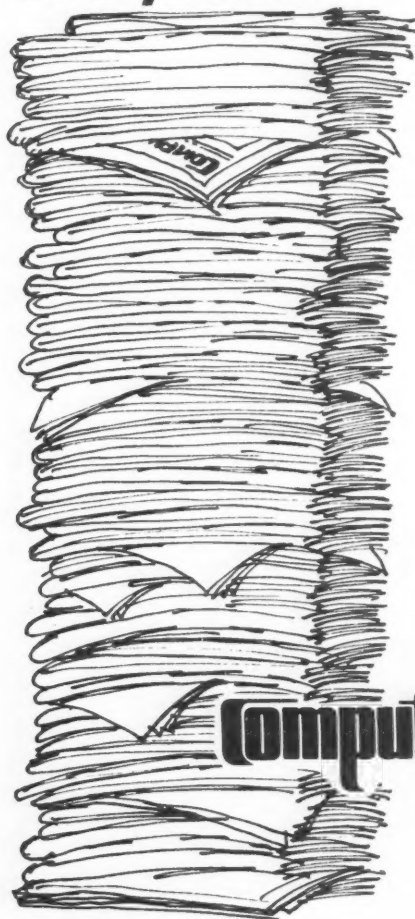
What sort of homecoming awaits them?

How much longer can this go on?

Another thriller next week!

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Forsyth is software manager for RAIR  
Timesharing in the UK.

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## Spots Incomplete Specs

# 'ASDM' Option Checks System Designs

CINCINNATI — Deliveries of an enhanced version of the Pride Automated Systems Design Methodology (Pride-ASDM) package are expected to begin this week on schedule, according to a spokesman for M. Bryce & Associates, Inc.

Adding the Automated Design Facility (ADF) to Pride-ASDM carries the package's support of the professional DP staff to the conceptual level of a system design. This is the next logical step for support that started as a paper-based project management tool, the spokesman said.

With the new capability, the systems analyst defines user requirements, prepares output descriptions and feeds them to Pride-ASDM. ADF takes the "specs" and analyzes them in reference to the systems and data dictionary provided with Pride-ASDM.

Internally, ADF performs data flow analysis and evaluates the data structures and all system elements within the environment. The result of this process is a

suggested system design, the spokesman explained.

If any information is found to be incomplete, the analyst is notified so he can make corrections. On the other hand, if the ADF-proposed design is not acceptable, the specifications can be modified and resubmitted to the system for analysis.

### Hierarchical Structure

The basic Pride-ASDM, which runs in nearly a dozen operating system environments, includes a standardized hierarchical structure for system components that logically describes "any type of process — batch, interactive, distributed," the spokesman said.

It also provides a data management system for defining structuring and relating data flows to the processes. A design method controls the derivation of systems and data components from information requirements, designing them from the top down but assembling and testing them from the bottom up, he noted.

An automated dictionary/directory records design decisions throughout the design process, resulting in documentation of all system and data components, organizations affected and events recorded, as well as all interrelationships between the entities.

By-product documentation is also provided for those who need to view all or part of any system from the master library. This support includes search capabilities to find common, reusable "parts" which might shorten the development cycle, the spokesman explained.

An impact analysis generated by Pride-ASDM allows designers to measure the extent of contemplated modifications to existing systems. A built-in project management system enables the user to plan and control the execution of the design method for any specific project, he added.

The availability of ADF now emphasizes the use and need for a generalized system and data

dictionary/directory where all system processes are maintained, according to the spokesman.

ADF also allows the analyst to request documentation to be produced by the system, including such items as system design manuals, administrative manuals and computer run books along with programming specifications. Flowcharts are printed for all of the various systems, subsystems and procedure flows, he said.

### Two Subsystems

The ADF option — which requires Pride-ASDM and cannot be a self-standing facility — consists of two subsystems. One focuses on the analysis of the analyst's input and its comparison to the stored requirements; the other generates all the documentation associated with the option.

In the U.S., the subsystems can be acquired together for \$9,000. Separately, the output analysis and system design portion costs \$7,000 and the documentation support, \$4,000.

Pride-ASDM runs on IBM 370s under DOS/VS or OS/VS, Burroughs Corp. medium-scale systems, Honeywell, Inc. Series 60 and H 6000 CPUs, Control Data Corp. 6600s, Hewlett-Packard Co. 3000s, Digital Equipment Corp. Decsystem-10s and 20s, Univac 1100s and units from International Computers Ltd.

Users should specify their environment when ordering the \$32,500 Pride-ASDM, the vendor said from 1248 Springfield Pike, Cincinnati, Ohio 45215.

## Messages Handled by 'Infoplex'

NEW YORK — The options available to installations considering electronic message switching as an alternative to traditional forms of interoffice communications increased by one recently with the announcement of the Infoplex service on the CompuServe, Inc. remote computing service network.

Infoplex enables any user who has authorized access to the system to compose and edit any sort of written message and then to send it to one or more addressees. But Infoplex also allows the sender to determine how accessible the message is to be at the addressee's location, CompuServe noted.

The messages might, for example, be available to anyone with the addressee's basic access code. Or they might be tagged "confidential" and therefore available only to those with a more restricted access code.

One of the options enables a sender to mark a message as one

that requires a response. Such a message cannot be casually eliminated after the addressee reads it; he must confirm that a reply has been made before that original message can be erased.

There appears little to limit the type of message sent. In addition to the expected administrative traffic, the system could support the transmission of program source code so that two centers working on a project can keep in touch, a spokesman pointed out.

Infoplex is "by no means a replacement for the telephone, facsimile, TWX or the mail," he stressed, "yet by combining the speed, accuracy and flexibility of DP with an electronic media" it can be a very effective complementary operation.

### Saves Nearly 60%

The vendor claimed that during a 60-day test, one user compared the cost of Infoplex with the cost of traditional forms of communications. Traditional methods

would have cost \$511; Infoplex cost \$205, for a savings of \$306, or very nearly 60%, the spokesman said.

The cost of Infoplex varies with the type of operation being performed. Further information is available from Plexus Corp., a subsidiary of CompuServe, Ninth Floor, 1211 Ave of the Americas, New York, N.Y. 10036.

## VLDB Conference Set

RIO DE JANEIRO — The Fifth International Conference on Very Large Data Bases (VLDB) will be held here Oct. 3-5 under the sponsorship of the IEEE Computer Society and the Association for Computing Machinery (ACM).

During the Conference, practitioners will exchange information, promote data base research and increase their un-

derstanding of the design, implementation and use of data base systems.

Forty-six papers will be presented, according to Prof. Stanley Y. W. Su, the U.S. conference chairman. Applications for travel grants and more information is available from Su at the CIS Department, University of Florida, Gainesville, Fla. 32611.

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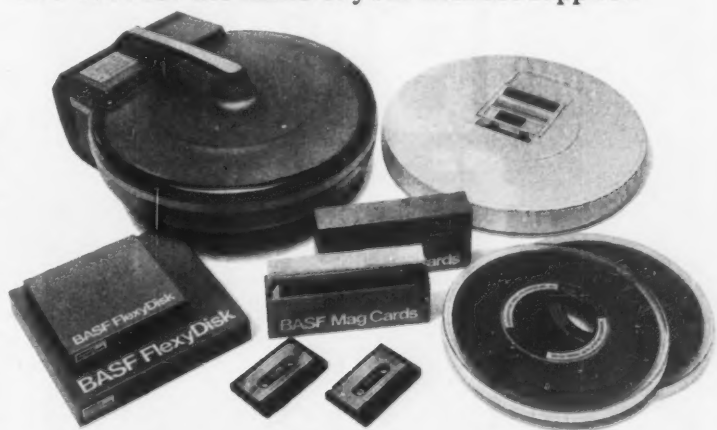
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## Payoff in Nine Months Software System Manages Micro Investment

By Don Leavitt  
CW Staff

PITTSBURGH, Pa. — It's always fun to talk to a user who feels he has solved a significant problem for his organization and sees the solution providing potential for more growth in the future, but who is modest about his own part in the whole operation.

Such a user is Robert V. Pierce, senior vice-president at C.S. McKee, an in-

vestment management firm here. Pierce was one of the leaders in the company's move away from dependence on outside time-sharing and toward in-house capability.

A portfolio manager, Pierce suggested the Midwest Scientific Instruments (MSI) microcomputer the company now has for security analysis. "We had been getting very little at high cost through time-sharing, and it ap-

peared we could do more faster by taking this route," he explained.

"The system paid for itself in nine months, now does four times what we used to do, yet is idle 70% of the time. For this reason we are planning to add municipal bond analysis and word processing," he continued.

### Faster Basic

Pierce was willing to get involved with his own system because his background was in computers before he went into portfolio management. He had to learn Basic since Fortran and Algol facilities were not yet available for the MSI unit. But MSI's Basic interpreter was too slow for Pierce.

Instead, he found that Software Dynamics, Inc. had a Basic that gave him "the additional power and speed we wanted." But the vendor proved even more valuable to the McKee operation since it had an operating system called SDOS which Pierce said is easy and reliable to use.

He clearly was very impressed with that particular piece of software. "The incredible power of the operating system came as a complete surprise and may never be fully usable by us," he said recently.

SDOS is an interrupt-driven system that can support "any number" of disk drives, he explained. Some of its more important features and benefits are very fast I/O; support for random and sequential named disk files; a read-ahead on sequential files; fully buffered, device-independent I/O; error files.

Pierce also pointed to SDOS' potential for backing computer-to-computer communications and time-sharing. Time-sharing is easily implemented under SDOS — "easily, that is, if you are an experienced assembly language programmer," he added — because the system works with tasks that have priorities and can be timed.

Turning to the SDBasic software, Pierce noted it was the first piece of software McKee purchased from Soft-

ware Dynamics "and its power and speed still amaze us." SDBasic is a compiler that produces an intermediate P-code that is interpreted by a runtime package.

That output "may not be as fast as machine code," Pierce acknowledged, "but it is significantly more compact."

At another point in his discussion, Pierce said McKee has the software up on the MSI micro with 48K bytes of random-access memory, 3K bytes of read-only memory and dual FD-8 floppy disks.

### Turnaround Down 60%

In addition to SDOS and SDBasic, the software from Software Dynamics includes an editor and an assembler. The total cost of the software was less than \$650, "but its implementation has meant a 60% reduction in turnaround time over our previous system."

Two years ago, when McKee was time-sharing, it took 24 hours to turn around a key weekly job at a reasonable cost, Pierce recalled. The MSI micro with the MSI Basic reduced that to about 2.5 hours of computation and a total turnaround of about eight hours.

With the MSI micro and Software Dynamics software, computation takes 20 minutes and the total job "about three hours."

Summing up, Pierce said that after 18 months, he has "absolutely no problem" in recommending microcomputers to any small to medium-sized business. "The only weakness is good software support, but application programs are coming and [in any case] it's not that difficult to do yourself if you currently use a manual system."

Somewhat surprisingly, he warned that "if you are already automated, it will be tougher if you have to learn to program from scratch. Even so, it is not out of the question and you can usually find someone to help."

"You might be surprised at the number of kids coming out of high school with some programming experience," he commented in conclusion.

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## MMSForth Drives TRS-80, Supports Virtual Memory

NATICK, Mass. — A variety of capabilities make MMSForth from Miller Microcomputer Services more powerful than other versions of Forth currently available for Radio Shack's TRS-80 microcomputer, a Miller spokesman said.

The MMSForth system diskette supplies, for example, full disk I/O support, virtual memory, double-precision integer math, auto-repeat support for the keyboard and a variable-character blinking cursor.

But the package also supports in-line editing, Level II Basic-like string handling and arrays, user-callable disk and tape I/O and the ability to produce hard copies of CRT screen images on a line printer, the spokesman said.

Forth itself is a structured language somewhat similar to Pascal. In Forth, however, the programmer can define additional commands as they are needed and later delete them when their usefulness is at an end, he said.

Assembler code can be inserted directly into the Forth program using a function of the language itself. This eliminates the need to preload assembler routines, as one normally does when trying to combine assembler in Basic programs, he said.

MMSForth has a "high compatibility" with versions of the language from Forth, Inc., he claimed. Forth tends to be so compact that a 16K-byte, disk-based system becomes practical for the TRS-80, he added.

Miller warned that MMSForth is not recommended for the neophyte programmer, but said the "MMSForth Primer," available separately for \$15 plus postage and tax, would help the beginner or the person evaluating the software before buying.

The MMSForth system diskette is available for a limited time for \$45, the vendor said from 61 Lake Shore Road, Natick, Mass. 01760.

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## Package Boost Graphics Options Available to Users of DG's 'Idea'

WORCESTER, Mass. — Sharply enhanced plotting and graphics capabilities are available to users of Data General Corp.'s Interactive Data Entry Application (Idea) software if they install the Interactive Plot (Iplot) package as well, according to the Iplot vendor, General Information Services (GIS).

Said to be compatible with all versions of Idea, the Iplot software allows the user to plot line or bar graphs on an Idea-controlled CRT screen. Iplot builds on the capabilities

of DG's "already powerful" screen-handling routines, a GIS spokesman said.

DG's handler had the ability to access Infos data bases, but the user was limited to displaying data in a limited number of fields, GIS asserted. Iplot adds the ability to display up to 150 points or bars per program call and to control screen-erase, automatic or prompted return and hard-copy printout on a satellite printer, the spokesman claimed.

The package was created as

an additional user program. The user controls the plot through the calling parameters, entered in the conventional Idea "passing record." The passing record for Iplot can be made separate from the one used by other programs on the same CRT, the spokesman continued.

Iplot handles simple line and bar graphs as well as graphs with multiple lines and bar graphs showing differences or deviations. GIS suggested plotting of trends and comparison of monthly or annual data as good applications.

Since enhanced graphics capabilities are generally new to the first-time Iplot user, the vendor offers assistance in implementing it. The package also includes a setup and test program to demonstrate Iplot's features.

Versions of the package run in two or three "block" partitions and cost \$1,400 to \$1,750, GIS said from 30 Valley Hill Drive, Worcester, Mass. 01602.

### 'TSS' Supports Multiple Users Under RDOS

BOULDER, Colo. — Polymorphic Computer Systems, Inc. has enhanced the Time-Sharing System (TSS) software to support and boost the capability of Data General Corp. mapped Nova and Eclipse processors running under RDOS.

Features added to TSS to enhance the multiuser environment include a resource access control facility, a spooling package and shared code support, Polymorphic reported.

The extensions to TSS are said to allow RDOS-based mapped Nova and Eclipse sites to have multiuser capabilities that would previously have required DG's more comprehensive Advanced Operating System (AOS) and the hardware it demands.

TSS can support any combination of user functions including general-purpose time-sharing, data capture and process control, a spokesman said. Each user can control more than one time-sharing job from a single terminal.

The software allows each user to independently develop, compile/assemble and execute any standard RDOS programming facility.

Mapped TSS uses extended memory whenever possible to reduce system overhead and optimize response time.

TSS costs \$3,900 per installation, with multiple installation discounts available. Polymorphic can be reached at P.O. Box 3581, Boulder, Colo. 80307.

## NCR Aids Banks

DAYTON, Ohio — The Variable Item Processing System (Vips) software recently announced by NCR Corp. will reportedly allow banks with large-scale NCR mainframes and Model 6780 reader/sorters to reduce costs in the physical handling of checks and other paper documents and the capture of data from them.

Modules available now include Proof of Deposit; Concurrent Reject; Reentry and Balance; Real-Time Cash Letter; Exception Item Pull; Cycle Sort and Fine Sort; Multipass Balancing and Missing/Free Report; and Microfilm Archival Retrieval.

The Vips modules cost \$2,400 for Multipass Balancing, \$3,600 for the Real-Time Cash Letter and \$4,800 for the Proof-of-Deposit. The Exception Item Pull, Cycle Sort and On-Line Fine Sort and the Microfilm Archival Retrieval packages each cost \$14,400.

More information is available from NCR branch offices.

## 'Practical APL' Topic Of Meeting Next April

WHITE PLAINS, N.Y. — Scientific Time Sharing Corp. (STSC) has announced plans to sponsor "The Practical APL Conference" at the Washington, D.C., Hilton Hotel next April, and a spokesman emphasized that the word "practical" is extremely significant.

Though expected to be larger than most workshops, the conference will have the "shirt-sleeves" sense of involvement that type of exercise usually provides, he said. "We're addressing both the business executive and the system designer," he added.

The executive will learn what can be done in APL, at what cost and by what means. The designer and implementor will increase his knowledge of what should be done and how to do it for a cost that makes it worthwhile, the spokesman explained.

Two of the invited speakers are U.S. Rep. Charles Rose

(D-N.C.), who addressed this year's National Computer Conference, and Dr. Alan Perlis of Yale University. Perlis' presentation may be particularly interesting since he was a long-time advocate of Algol before he "converted" to APL, the STSC source commented.

Most of the topics to be discussed at the sessions in the April 9-11 conference have already been decided, according to STSC Vice-President Allen J. Rose, who is organizing the program. However, he is still open to suggestions.

The registration fee has not yet been decided, but will probably be in the \$300 range, Rose said.

Requests for more information or registration material can be sent to Rose or Joan Gurgold, conference chairman, at STSC's regional offices here at 7 Holland Ave., White Plains, N.Y. 10603.

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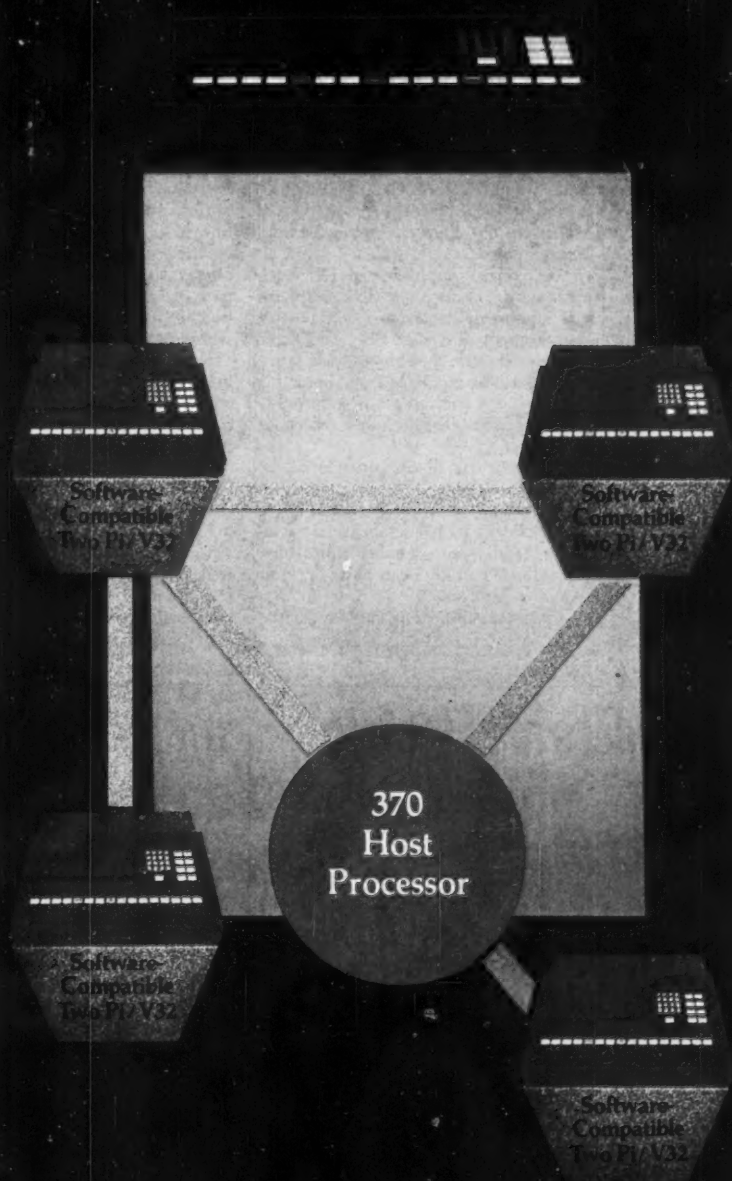
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# Package Cuts Paper Use as It Aids Debugging

By Brad Schultz

CW Staff

DETROIT — A major manufacturer here sharply reduced its demand for continuous-form paper by running a diagnostic software package that automatically suppresses core dumps and expresses its analyses of software troubles in English.

Since the Ford Motor Co.'s central DP operations began running the package last August, it has diagnosed the causes of about 90% of the facility's aborted jobs, or abends. By averting core dumps, it has reduced printout volume by roughly 26 million print lines each month.

Besides pruning supply expenditures, the package saves up to 1,300 man-hours in dump analysis time monthly, according to Allen Peterman, the facility's supervisor of systems programming. Peterman installed the package — reportedly in just a few minutes — and is responsible for maintaining it as a tool for applications

software development.

Ford declined to state how much money it has saved with Tomark, Inc.'s Abend-Aid package. But diminished labor costs account for two-thirds of the savings and the remaining third consists of reduced outlays for paper, ribbon and printer time, according to Peterman.

Core dumps are computer printouts that specify the contents of programable main memory allocated to a particular software development project. With many batch systems, a core dump is triggered automatically in the event a job is aborted.

The idea is to give the software development team a "snapshot" of memory at the moment the job went haywire in an attempted execution. In a painstaking process of inspecting the contents of memory, word by word, the developers track down software bugs and then try to eliminate them.

Each dump normally expresses memory contents in cumbersome hexadeci-

mal notation, consuming yards of output paper. For many development shops, dumps account for a major portion of total expenditures on DP supplies. For Ford and most other large users, supplies and labor are the fastest growing categories in their overall DP budgets, Peterman pointed out.

And Ford is certainly a large user. At the carmaker's main facility, Abend-Aid runs under MVS on three IBM 3033 mainframes, two IBM 370/158s, a 370/168 and an Amdahl Corp. 470V/6-II. Up to 5,000 jobs serving at least 800 programmers run on a triplex configuration of the Amdahl CPU and two of the 3033s, Peterman said.

## Representative Month

In a representative month, the triplex processors — which communicate with each other via channel-to-channel adapters — registered nearly 7,000 abends, Peterman noted. The Tomark package explained the causes of about 5,000 — more than 70% of the total — without inducing core dumps.

In that same month, roughly 800 abends were debugged without using the package; dumps were avoided for 300 of them — less than 35% of that total, Peterman said. Hence, Abend-Aid has allowed users of the triplex configuration to double the proportion of aborted jobs they can debug without core dumps.

"In today's sophisticated DP environment, the memory dump remains as an absurd anachronism," a Tomark spokesman observed. "We now have computers that are able to direct space flights to the moon, but we are unable to have the computer solve the most trivial problem for the application programmer."

"Humans are ill-equipped to calculate in hexadecimal," he declared. "It is easy to make a simple error and chase an incorrect path and, in some cases, come to an incorrect conclusion which may lead to another computer run and yet another dump."

Abend-Aid was designed to make the

computer perform as many analysis tasks as possible and tell the user exactly what happened in English text, the source continued. "In cases where Abend-Aid is unsure of the problem, additional output is provided showing key areas and calculations that would normally have to be extracted and performed by the programmer."

Abend-Aid automatically suppresses dumps if it can immediately pinpoint the cause for the aborted job. The package consists of more than 200 assembler modules that are automatically loaded and deleted at the time of abend in order to account for it.

After all intercept and recovery routines in IBM's repertoire of abend software have failed, Abend-Aid is invoked automatically and runs transparent to the user, the Tomark spokesman said.

## Suggested by Employee

Apparently, Ford management felt the programmer who suggested that the company buy Abend-Aid "had a better idea." In accordance with an employee suggestion incentive program, Ford gave the programmer U.S. savings bonds equivalent in value to a "moderately equipped" 1979 Ford Mustang, Peterman noted.

An acquisition committee found only one serious competitor of Abend-Aid on the market: a package called Mini-Dump from Avar Associates. Peterman originally favored Mini-Dump because it seemed to offer comparable performance at a lower price.

However, Avar Associates tripled its price for Mini-Dump while the committee deliberated, Peterman recalled. Suddenly, Abend-Aid was the lowest priced alternative and won the committee's endorsement. Soon afterward, Peterman had the programmer who first proposed the purchase transferred to his own staff.

The Tomark package is probably well-suited to users much smaller than Ford because its operating cost is proportional to the volume of processor activity, Peterman suggested.

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## Univac OS/1100 Topic of Course

WASHINGTON, D.C. — Actual examples and detailed case studies will form the backbone of a course here Oct. 1-5 on how to measure the performance and increase the productivity of Univac 1100 series CPUs running under OS/1100.

Offered by Applied Educational Services (AES), the course will be taught by John Kelley, past chairman of the Performance Measurement and Evaluation Committee of USE, Inc., a user organization largely devoted to supporting installations with large-scale Univac systems.

Kelley's examples and case studies will demonstrate methodologies for identifying performance bottlenecks. Special emphasis will be placed on correct interpretation of the data collected by Univac's Software Instrumentation Package.

The registration fee is \$595 per person and includes comprehensive course materials. More information is available from AES, 4815 Kempair Drive, Woodbridge, Va. 22193.



## 'CDU' Tracks CICS Runs, Puts System Data On-Line

CANTON, Mass. — The CICS Display Utilities (CDU) package from Communication Software Aids was designed to allow a system programmer to retrieve information internal to IBM's Customer Information Control System (CICS) and to get updated information on-line on demand.

Intended for OS/VS environments, CDU contains both general and specific monitoring information, according to a vendor spokesman. For general real-time monitoring, the package includes programs that display the status of terminals, files, transactions, programs, tasks, dynamic storage, Vtam and system control information, he explained.

For more detailed monitoring efforts, CDU includes programs that display memory with address translations, system DSECTs with their hex displacements, and Isam, Bdam and Vsam records — again, with address translation, the spokesman continued.

CDU was implemented as a CICS application that is independent of whatever release of the teleprocessing monitor is in use. It was coded to use an IBM 3277 Model II CRT terminal for its screen displays.

The package is available for a one-time license fee of \$4,800 from Communication Software Aids, 36 Pequit St., Canton, Mass. 02021

## 'Recoup' Cuts Compile Times

GREAT NECK, N.Y. — Recoup from Labyrinth Systems, Ltd. saves upward of 50% in the hardware costs normally incurred when compiling and link-editing Cobol programs in an IBM OS/VS environment, a spokesman claimed.

The savings in each individual compile/link-edit-related job are usually in the 40% to 60% range, allowing compile turnaround time to be essentially cut in half, he said. The savings occur significantly in CPU time, I/O events and system occupancy time, he added.

While specific reductions in those three areas vary, Recoup — on the average — reduces CPU time by 10% to 30% while I/O events (EXCPs) and system occupancy characteris-

tics show reductions of 45% to 65% on "moderately loaded" — not otherwise defined — mainframes, the spokesman said.

### DOS in the Works

Currently available only for OS/VS sites, Recoup is being adapted to work in DOS/VS installations as well.

After an on-site demonstration, the package is available until Labor Day for a one-time fee of \$12,000 plus \$180/mo, which includes on-site maintenance. After Labor Day, the one-time fee jumps to \$18,000 while the monthly fee remains \$180/mo.

Labyrinth is at 420 Great Neck Road, Great Neck, N.Y. 11021.

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If you're interested in more information on renting printers or terminals from Rental Electronics, call one of our local rental centers today.

They're listed opposite. Our on-line computers at every location let us give you price and availability information instantly, while

you're still on the phone. In the meantime, check some of our featured rental offers below.

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Here is a sampling of the printers and data terminals available from Rental Electronics. Call or write today about your specific needs.

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Printer operates at 150 cps on 9 x 7 wire matrix assembly printhead. Full ASCII Keyboard (ANSI-compatible) with N-key roll over. Operates in Asynchronous, USASCII, RS232C interfaces and is compatible with Bell 103, 113, 202 and 212 units. Selectable baud rates of 110 to 9600.

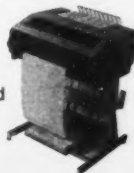


### Hewlett-Packard 2621A/P Terminals

Enhanced 9 x 15 dot character cell, full 128-character ASCII character set in 24 80-character lines. Two pages of continuously scrolling memory. RS232C and Bell 103A compatible. 110 to 9600 baud. 2621/P includes built-in printer operating at 120 cps.



**Tally T-2000 Hush-Tone Line Printer**  
Acoustically designed enclosure. Operates at 125 (Model 2100) and 200 lines/minute (Model 2200) with standard 64 character USASCII. Line spacing switch selectable, 6 or 8 per inch.



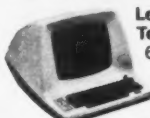
**ADD5 Regent 200 Terminal** 24 lines x 80 characters, 25th "status" line shows operating mode. 128 character ASCII. RS232C/CCIT V.24 communications interface operating 75 to 19.2 BPS, switch selectable. Buffered transmission, auxiliary ports.



**Beehive Micro B 1A Terminal** 128 ASCII character set; switch selectable scroll/non-scroll mode; X-Y addressing; 24 x 80 display format; single key memory lock; fully buffered communications to auxiliary peripheral device.



**Leas Siegler ADM-3A Data Entry Display Terminal** 12" diagonal, 24-line screen. 64 ASCII characters. Full or half duplex operating modes, switch selectable, baud rates from 75 to 19,200. RS232C interface, 20mA current loop.



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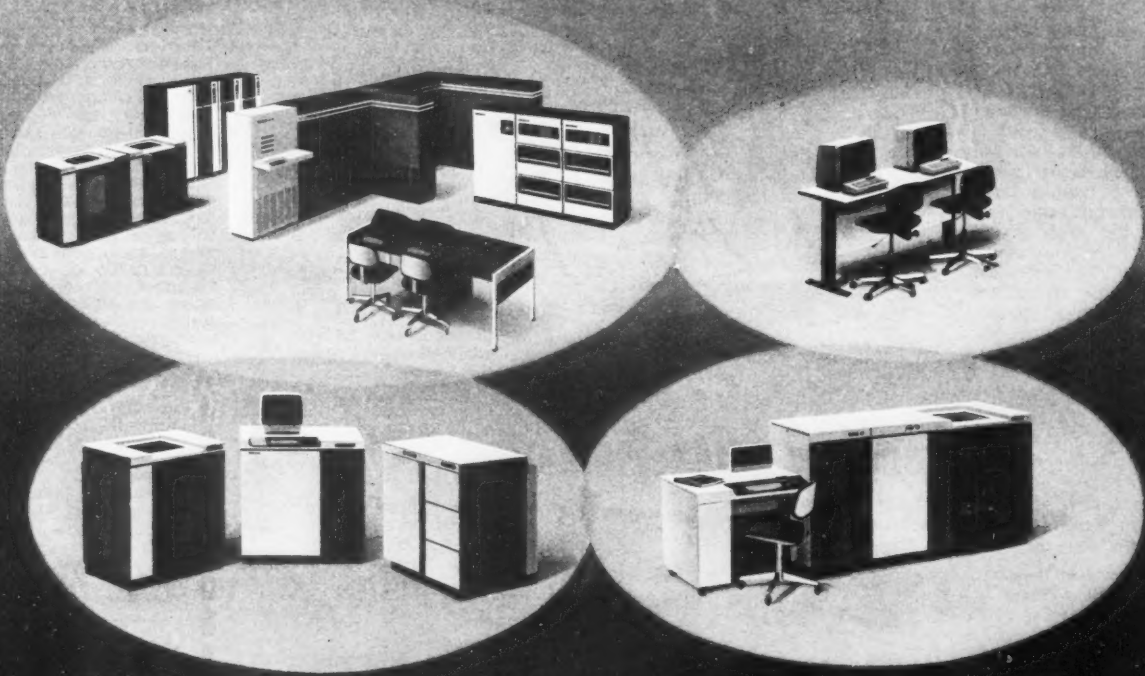
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# Burroughs

## Works With SNA Simulator Eases IBM-Based Networking

WHITE PLAINS, N.Y. — IBM has revised a software program that works with the vendor's Systems Network Architecture (SNA) to give users a dress rehearsal of the way an IBM data communications network is likely to function before actual operations begin.

The Teleprocessing Network Simulator (TPNS) from IBM's Data Processing Division builds a model of a network specified by the user, generates messages and sends them across communications lines to applications programs under test.

With TPNS, users can test communications applications before IBM terminals are installed, anticipate bottlenecks and run tests in less time than otherwise possible, a spokesman maintained, adding that this allows a user to focus more attention on developing new applications and spend less time on the details of networking.

The highlights of TPNS Release 5 report-

edly include a parallel sessions capability that permits multiple sessions between pairs of logical units; negotiable bind feature under an SNA command that establishes a session's protocols and parameters; and compatibility with IBM's data encryption products.

TPNS/5 attaches directly to IBM's Advanced Communications Function/Network Control Program (ACF/NCP) software. A dedicated IBM 3705 communications controller is not required by TPNS/5 to run domain simulations because the program can share a 3705 with ACF access methods in a "multitail" environment.

However, TPNS/5 will require a dedicated 3705 under a TPNS control program to simulate terminals controlled by the system being tested, the spokesman noted.

The revised program's 3705 support enhancements include support for 3705 models J, K, and L with storage exceeding

256K bytes and a number of channel enhancements.

### Support for 8100 Users

TPNS/5 also provides support for devices attached to the IBM 8100 distributed systems via telecommunications links or remote loops, the spokesman continued. TPNS reportedly simulates the entire remote loop with its attached devices.

On the 8100, TPNS/5 is said to simulate a certain class of devices that employ device headers rather than standard SNA headers. The program also provides support for APL programming and text editing.

The minimum configuration required to run this revision of TPNS is an IBM 370/-145 with the conditional swapping feature and at least 448K bytes of virtual memory. In addition, two transmission control units (TCU) are necessary for all but domain simulations. One of these units must be a 3705 with at least 80 bytes of memory that are dedicated to TPNS during simulations.

The other TCU may be a 2701, 2702, 2703, 3704 or 3705 controller, the spokesman said. TPNS/5 executes under current releases of OS/VS2 (MVS), OS/VS2 (SVS) and OS/VS1 control software.

To simulate encryption, TPNS/5 can work with IBM's 3276/11, -/12, -/13 and -/14 display stations using the encrypt/decrypt feature under ACF/Vtam.

TPNS/5 is scheduled to be available under warranty starting Oct. 26 for \$900/mo.

## For Southern Calif. EFT Tymshare Plans ATM Network

CUPERTINO, Calif. — Tymshare, Inc. will start delivering an electronic funds transfer (EFT) service to financial institutions this January when the first phase of a shared automated teller machine (ATM) network is inaugurated in southern California.

That network will employ an EFT switch Tymshare recently acquired from the Savings Association Central Corp. (Sacc). Savings and loan associations in the San Fernando Valley north of Los Angeles will be the first users of this ATM system, Tymshare announced, adding that more than 20 savings and loans have already contracted for the service.

According to Tymshare, "this is the first time in California that an ATM project has crossed proprietary lines to incorporate a fully shared concept from an independent, third-party EFT service supplier." A new subsidiary — Tymshare Funds Transfer Services, Inc. (TFTS) — will market and operate the ATM services.

"All financial institutions will be able to issue plastic cards to their customers to access their accounts through the . . . network," the firm said. The ATMs will not be identified with any particular institution and will be placed in "neutral" locations throughout the

valley, including shopping centers and supermarkets.

The service will allow deposits, withdrawals, transfers from one account to another and account balance inquiry. Present plans call for IBM 3624 ATMs to commence

(Continued on Page 42)

## Datapoint Cuts Switch Costs

SAN ANTONIO, Texas — Potential users of Datapoint Corp.'s Infoswitch long-distance control system (LDCS) can now take advantage of reduced costs designed to attract smaller users.

In a four-part program, called LC2, the vendor is offering a reduced lease rate on the LDCS/6, -13 and -20 systems; a far cheaper 160 char./sec printer; a guaranteed savings on two of the three LDCS; and an "agency letter," in which the user signs over to the vendor the burden of coordinating system installation between the telecommunications company and Datapoint.

Reduced rates on LDCS are effective on one-, two- and three-year leases, with a cut of 25% on the LDCS/6 and -13 and 15% on the LDCS/20. Lease rates are now \$1,095,

\$1,334 and \$1,917, respectively, for one year, Datapoint said.

The price of the Model 9622 printer is \$2,895, a reduction of \$2,645 from the price of the previous 160 char./sec printer offered in the LDCS system. On a lease basis, the rate for the 9622 saves the user \$90/mo.

"These systems offer benefits for a smaller company spending \$5,000 to \$20,000/mo on telecommunications. In fact, the lease price equates to the amount a company would spend for one Wats line," a spokesman said.

The guaranteed savings program for the LDCS/6 and -13 is based on the assumption that the system will reduce the cost per minute previously spent by the company

(Continued on Page 42)

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Each Modem Provides:

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# Device Emulates IBM Bisynchronous Terminals

DEXTER, Mich. — A two-piece remote-batch terminal emulator (RBTE) for a series of IBM binary synchronous terminals has been introduced by Winterhalter & Associates.

It includes a binary synchronous RS-232C port that displays all binary synchronous characters on the terminal attached to it.

The RBTE is a standard 2780, 2770, 3741 and 3780 emulator and is currently available for systems using Zilog, Inc. Z80 microprocessors, Intel Corp.'s 8251 or Zilog's SIO serial ports and running under CP/M or in a communications controller.

The RBTE dynamically configures itself to emulate the specified terminal in 13 configuration parameters, and the unit uses the supported terminal's set-

up file to configure itself to the terminal, Winterhalter explained.

The two modules — a bisynchronous driver that performs all protocol handshaking and a terminal emulator that formats the transmission blocks — are claimed to be easier to use than a single piece emulator.

To use the RBTE, the user must have a floppy disk system with file management software, an asynchronous RS-232C interface and a real-time clock.

The RBTE is said to help users avoid expensive communications analyzers in order to examine and control the data exchange between terminals and computers. The diagnostic port serves to display bisynchronous framing characters, enabling the product support specialist to diagnose a problem

on-site.

The port may also have a modem connected to it to allow the user to dial in and view the framing characters directly, Winterhalter indicated.

Cost for the system is \$500.

Winterhalter also introduced a terminal emulator that allows the user to write his own application to access communications routines and bisynchronous communications, and it is also sold as a two-piece system. Residing in the host processor as a Fortran program, the emulator packs the disk records into transmission blocks which are transferred to the serial protocol processor and sent to the remote terminal.

The product reportedly emulates a variety of remote-batch terminals by

specifying the file that contains bisynchronous configuration parameters or by modifying the default configuration parameters in the initialization section of the program.

In either case, the remote-batch terminal must conform to a generic IBM 2780 or 3780 terminal. The emulator was designed to run unattended to receive only or to transmit and receive data files. Once an error occurs, the program will exit.

The terminal emulator costs \$500 from Winterhalter & Associates, Inc., 3825 N. Zeeb Road, Dexter, Mich. 48130.

## Tymshare Plans ATM Network

(Continued from Page 41)

operations during the first quarter of 1980.

These ATMs will be on-line around the clock, supporting all point-of-sale transactions and offering "just about any" debit or credit card transaction, according to a TFS spokesman. The average cost to the original participants for use of up to 20 ATMs will be less than \$4,000/mo — about 10% of what a proprietary network might cost, he declared. The firm expects to base fees on the value of transactions by 1982.

The switch will communicate on-line with host processing centers in San Diego, Fresno, Pomona, Los Angeles and Orange County, Calif. Line protocols from IBM, Univac and Burroughs Corp. and various NCR Corp. system configurations will interface the network, the spokesman stated.

TFS has high hopes for these services. "Consumers will be pleased with the wide choice of institutions, reduced congestion and convenience of location and hours. Merchants [will] benefit from increased traffic at ATM locations," the spokesman continued, "and financial institutions will appreciate the extended hours of service and the added locations at an affordable cost."

## Datapoint Cuts Infoswitch Cost

(Continued from Page 41)

on telephone line communications. When Datapoint delivers a proposal, it will guarantee savings based on a reduction in cost per minute for the first 90 days following the installation of the LDCS.

If, at the end of that time, the savings has not been realized, the customer can return the equipment and receive a refund against the 90-day down payment for losses on the guarantee, Datapoint said.

The fourth section of the cost-cutting program frees the customer from acting as the coordinator of LDCS installation details. "Although the customer retains control over the interaction of Datapoint and the phone company, Datapoint actually assumes the task of orchestrating the details of the installation," the spokesman explained.

Datapoint is headquartered at 9725 Datapoint Drive, San Antonio, Texas 78284.

## The Data Duo. From DTC.

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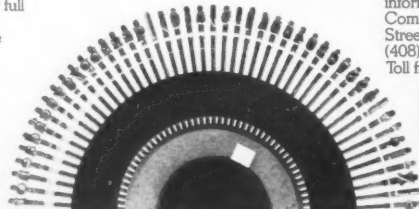
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In fact, our M80 family performs precisely to IBM operating principles. Yet it uses dramatically fewer components, delivers twice the price/performance and is only a fraction the size of 360/370 mainframes.

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360/370 users know that each CPU changeout costs more than just cash and trauma. It also forces you to pay for much more computing power than you need, then grow into it. And nothing inhibits growth like a dead investment.



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# TI Microprocessors Drive Sweda POS System

PINE BROOK, N.J. — A point-of-sale (POS) system driven by Texas Instruments, Inc. TMS9900 16-bit microprocessors has been introduced by Sweda International.

Several of the TI microprocessors are used throughout the L-70 system, specializing in such functions as display, printing, handling of peripheral elements and communications.

Four variations of the L-70 cash register terminal are planned for delivery in the first quarter of 1980. Two are destined for supermarkets and the other pair for general merchandise discount stores.

The terminals will eventually be offered in configurations appropriate for smaller market applications, a spokesman indicated.

As many as 15 L-70s can be networked with a built-in consolidating device, but an external consolidating device called the System Four is also available to provide greater information processing and reporting capabilities as well as the capacity to consolidate up to 64 terminals.

Both consolidation devices centralize data base management and reporting, using in-store terminal-to-terminal communications. Any terminal can be asked to give period-to-date totals, providing a historical record of pertinent systems data, the spokesman said.

Program loading and file

maintenance can be accomplished from a single point. Any station in the loop can function as the central manager's station, he added.

Various terminals will be offered with base memory from 6K bytes to 28K bytes.

## Ready for Bubbles

The L-70 terminals reportedly support mass memory modules and can store up to 200 price lookups and Univer-

sal Product Code price codes. The terminals are set up to accommodate 256K-byte bubble memory chips when they become commercially available, the vendor claimed.

Communications among terminals is handled through a 4,800 bit/sec synchronous loop under a bit-oriented protocol, providing the means for communications to be handled as a distributed network.

The L-70 supports scales,

slip printers, turret displays, and bar code, OCR-A and credit card readers, among other things. In addition, peripherals available with the System Four consolidator include a dedicated manager terminal and an 80-column report printer.

The terminals can be ordered with two 20-character alphanumeric vacuum fluorescent displays — one for the operator and one for the cus-

tom — and a dot matrix alphanumeric printer with an 18-column journal and a 24-column receipt.

Sweda expects to release prices on the four types of L-70 terminals sometime in September, the spokesman said, estimating that their price range will extend from \$2,700 to more than \$5,000.

Sweda International is at 34 Maple Ave., Pine Brook, N.J. 07058.

## Giltronix Builds RS-232 Switchers

PALO ALTO, Calif. — A series of rack-mountable units that allow the user to switch and monitor any RS-232C interconnect system has been built by Giltronix, Inc.

The series consists of three models — the GRS232-SC, GRS232-25C and GRS232-35C — with the latter two models containing two and three GRS232-SC units, respectively, on the same chassis.

The smallest model, the GRS232-SC8 — with the ability to switch eight channels — costs \$189.95, while the 16-signal switching unit costs \$209.95 from Giltronix at 3156 Avalon, Palo Alto, Calif. 93406.

## Tabcard Holders

supplying holders for all types of D.P. systems



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### For Remote Terminal Users... The Acoustic Coupled VA3434

Great news for remote terminal users. Racal-Vadic is in full production on the VA3434, a 1200 bits per second, full duplex acoustic coupler — completely compatible with all VA3400 series modems.

Now, by merely replacing your 300 bps coupler with the VA3434, you can instantly step up to 1200 bps full duplex, with the portability that only an acoustic coupler can provide. And since data flows four times faster, phone charges may be less, too.

More great news. The VA3434 is available from your local Racal-Vadic stocking rep.

### For Remote Terminal Users... The Direct Connect VA3455

The Direct Connect VA3455 is a low profile, highly styled 1200 bps full duplex modem specifically designed for remote terminal users.

This compact modem, and its companion, the VA871 VadicPhone, connects to any dial-up line — be it residence, business, WATS, behind a PBX... you name it. It's as easy to use as an extension phone. Just plug into any standard Telco voice or data jack and start communicating at 1200 bps full duplex. Nothing could be simpler.

Good advice. Order your VA3455 Direct Connect Modem and VadicPhone today from your local Racal-Vadic stocking rep.



# Backs Marketing, R&D, Business DP

## DP Vendor's Network Ties International Offices

Special to CW  
WELLESLEY HILLS, Mass. — One of the most sophisticated data communications networks in use today is operated by Prime Computer, Inc. for its own use. The network is used to process the company's international business and engineering tasks and to regularly test and improve its Primeret data com-

munications software and networking products.

Twenty-one Prime systems in four suburban Boston locations are accessed using interactive CRT terminals that give Prime management instant access to accurate, up-to-date information. These systems are linked with Prime's international research and development center in Bedford,

England, using the British Post Office International Packet Switching Service (IPSS) and the U.S. Telenet network. This is the first time host computers on opposite sides of the Atlantic have communicated this way.

The transatlantic computer communications link uses Primeret's X.25 protocol capability to interconnect the Bed-

ford facility with U.S. data centers in Wellesley Hills, Newton, Natick and Framingham, Mass. This link provides users with processing capabilities in three key areas: marketing support, business DP, and engineering/research and development.

### R&D Programs

Engineering and research

and development (R&D) programs are run on 13 interconnected Prime systems, eight in the Newton R&D facility and five in Natick, about 10 miles to the west. On June 1, Prime began the first transatlantic IPSS/Telenet computer communication, which now enables Prime's two R&D facilities on either side of the Atlantic to keep completely current about software and hardware developments by transferring mail, files and software to one another interactively.

The Wellesley-based systems are linked to Framingham by a 4,800 bit/sec line, as are the Newton R&D and the Natick systems. The latter two are linked by two 4,800 bit/sec lines because of high traffic volumes.

Though the system is not a closed loop, a user at any terminal in Prime's internal corporate network can access any other computer in the network, provided that user has the "key" to get into each of the "locked" systems. Several levels of protection are provided, including passwords and privilege.

Prime's IPSS/Telenet link enables Prime systems in Bedford to access files of any of Prime's 21 computer systems in eastern Massachusetts which link the R&D departments with engineering, education, finance and marketing facilities.

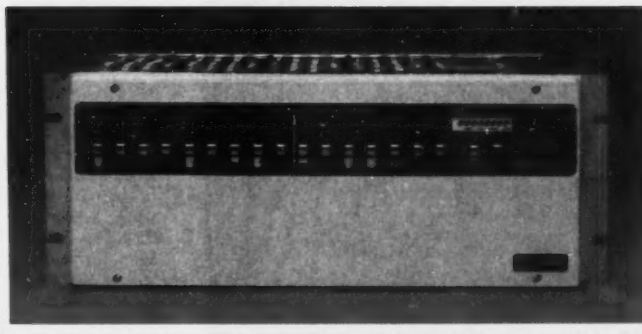
Prime has used its own computer systems since its beginning in 1972 to run engineering and R&D programs. In March 1977, Prime began processing its business data on the network. A file access manager (FAM), previously used by engineering, was applied to the business DP environment, allowing several departments within Prime to exchange information via computer.

In June 1978 Prime developed a remote log-in feature that further enhanced the network and provided a key feature in the currently available Primeret software offering. With this feature, users at one location can log into a remotely located Prime computer system and get full use

(Continued on Page 46)

Dear Ma:

When it comes to 1200 bps full duplex modems for remote terminal users and central computer sites...Racal-Vadic has tied it all together.



### For Central Computer Sites... The VA3467 Triple Modem

Racal-Vadic's Direct Connect Triple Modem, with built-in microprocessor, automatically changes into a Vadic VA3400 Series modem, a Bell 212A, or a Bell 103, depending on which remote modem is calling. Mind boggling but true!

The VA3467 has already become the standard for central computer sites, because a single modem can now handle traffic at all popular speeds from 0 to 1200 bps.

Benefits are many. Remote users can dial a single phone number, regardless of whether the

calling modem is a VA3400, a 212A, or a 103. This means a single computer port can service most

remote terminals, and split rotaries can be eliminated. A single phone number is all that's necessary. The VA3467 Triple Modem does the rest.

The VA3467 is a space saver, too. 8 modems fit into a VA1616 chassis, just 7 inches high. Up to 48 Triple Modems can be housed in a single 7-foot high rack.

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# Direct-Connect Modem Offers Built-In Dialing

PHOENIX — Dialing capability has been built into a direct-connect originate/answer/auto-answer modem from Omnitec Data.

Unlike direct-connect modems with an exclusion key arrangement to access the line after dialing, the 9113BOD is claimed to be unique because it has the dialing capability built in.

To originate a call, the operator presses the "\*" on the Touch-Tone-type keypad. The modem accesses a dial tone, which is heard through the audio monitor.

When the number is dialed, the circuitry converts the numbers to rotary-type dial pulses, enabling the modem to be used on either rotary or Touch-Tone lines.

Once the number has been entered, it can be redialed by pushing the "\*" on the keypad. The number remains programmed in the unit even if power is removed or if other numbers are entered into the keypad.

With a standard data rate of up to 450 bit/sec or 600 bit/sec optional, the unit has both RS-232C and 20mA current-loop interfaces, Omnitec Data said.

The modem features transmitter and

receiver filtering, CMOS logic and nine diagnostic LED indicators, including data set ready, terminal ready, ring indicator, carrier detect and request to send.

The 9113BOD has been approved by the Federal Communications Commission for use with programmable data jacks as well as permissive data jacks. It is available without it as well; in that configuration the transmit level can be set from 0dB to -12dB by dip switches

to match the various levels that could be called out on a Direct Access Arrangement.

An answer-only unit is available with the model designation 9113BD; it comes without the built-in dialing capability. Omnitec Data also provides a leased line originate or answer modem called the 9113BL for leased lines.

The 9113BOD costs \$454.25 from Omnitec Data, 2405 S. 20 St., Phoenix, Ariz. 85034.

## Vendor Net Ties International Offices

(Continued from Page 45)

of that CPU, memory, disk files and data in those files and run programs on that system. However, the proper

passwords and privilege keys are required, thus guaranteeing a level of security and file protection.

Prime's Framingham data center, op-

erated by 11 employees, runs all the company's business data programs. An inventory control system run on the network has helped Prime eliminate the expense of taking a periodic wall-to-wall physical inventory, and still achieve year-end book-to-physical inventory variances of less than .1%.

According to Allan N. Stevens, Prime's vice-president in charge of materials management, these results were achieved using a computerized cycle count method representing 80% of inventory dollar value.

### Inventory Control

The inventory control system also includes a spare parts inventory, begun in February 1978. It reports inventory movement, shipment and receipt, which allows the field engineering department to access up-to-date parts information easily.

"Because manufacturing knows the current status of raw materials, work in progress and finished goods, they can reconfigure and ship an order within a day to meet demanding customer needs," according to Edward J. Verock, director of business systems.

If a customer has an emergency, a 24-hour dial-in service allows the local field engineering manager to check his region's inventory for the desired part. David Sweetman, Prime's project manager for networking systems, said, "Since we've begun using the network, we have a much more accurate count of the parts in stock and their exact locations. This increases our ability to respond to customer needs."

Prime's new systems assembly and test complex, located in Framingham and recently opened, houses two more systems accommodating 30 to 40 on-line users doing order entry, cost accounting and inventory functions.

Prime's engineering department also uses the network to develop and test software and hardware for customers and in-house systems. For example, information is currently exchanged in the development of a data base for printed circuits.

The Prime network also performs a vital role in the company's financial organization. Sales invoicing and cash disbursement transactions are executed interactively by Prime's own finance people, using the business systems computers. This avoids hiring the large clerical staff typically required to process transactions in time-consuming manual or batch processing environments.

The finance organization also uses the network to project foreign currency translations, monitor several hundred tax filings and report budget and actual expenses by departments within Prime.

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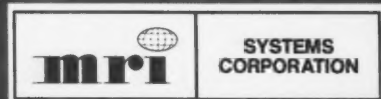
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**FR: The people with a better business decision.**

**RE: A 4341 alternative that's available today.**

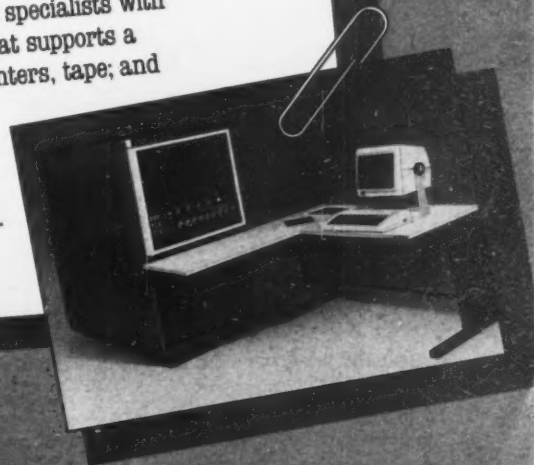
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**More than a computer company**



## Replaces Link With Service Bureau Net Saving Garden Tool Maker \$140,000/Year

Special to CW  
COLUMBUS, Ohio - One of the largest manufacturers of industrial and home garden tools has reportedly saved at least \$140,000 a year in computing costs by using a distributed network.

The Union Fork and Hoe Co. (UF&H), with 750 employees, has realized those savings in its accounting costs and has improved management control with the network, according to Dick Smith, its vice-president and controller.

With company headquarters

here in Columbus plus two separate manufacturing facilities in Ohio and one in New York State, UF&H had been spending much time, energy and money processing orders and handling data for its 7,000-item inventory. To complicate matters, its largest customer — a major retailing organization headquartered in Chicago — generates a large volume of accounting transactions that require daily reports.

With the distributed system, UF&H gives that customer better service with a direct in-

terface between its CPU in Chicago and the host computer here at headquarters.

The distributed network includes seven CRT terminals and a 300 line/min printer in Ohio, two CRT terminals and a printer in the Frankfort, N.Y., factory and a synchronous dial-up data link to the customer in Chicago.

The Basic/Four Corp. Model 730 minicomputer in Columbus has 132K bytes of memory and a pair of 75M-byte disk drives. The CPU contains built-in interface circuitry for the communications links, including RS-232C and Bell 201C ports. Total cost for the network is \$160,000, according to Smith.

Transmissions between the Columbus CPU and the New York terminals are carried over two dedicated phone lines, one for the printer and one for the two CRT terminals. Data transmission occurs at 1,200 bit/sec on the asynchronous lines.

The network replaced a communications link with a service bureau that required UF&H to first put data on keypunched cards, then transfer it to tape. "We got our processed data back the following day — if we were lucky," Smith recalled. "Now we have a 2,400 bit/sec synchronous data link with our Chicago customer, and we use the network every day — to send and receive orders, shipping notices, invoices, production information, inventory control and other accounting information."

### Frankfort Operation

The remote Basic/Four printer in Frankfort allows the company to produce shipping labels and invoices there directly from the Ohio headquarters. The staff at headquarters also uses the CPU for accounts receivable, accounts payable, payroll and sales reports. Reports range from line item histories to complete cor-

porate summaries.

CRT terminals are located in the parts storage areas, where the personnel can use the system immediately for entry and retrieval of data. The data link to the Chicago customer allows daily shipping information and invoicing to be fed directly to the customer's central accounting computer.

Local management functions can be carried out at the local workstations, without waiting in line for computer time at the home computer or shipping data for off-hour batch processing. The system includes circuitry that queues teleprocessing inputs and outputs to make optimum use of the high speed data communication lines.

"We're extremely happy with the Basic/Four system," Smith said. "I'd recommend any medium-sized company shopping for distributed networking capability to take a long look at it before making a final decision."

## Worried About Data Couplers?



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the shelf full!**

GDC's FCC-registered data couplers are available in quantity from stock to interface non-FCC-registered user owned equipment to the switched network. (As of July 1, 1979, by FCC ruling, any new data coupler must be FCC-registered.)

- GDC 1000A (CDT) is a direct replacement for WECO 1000A.
- GDC 1001A (RBS-3) replaces WECO 1001A or 1001F (CBS).
- GDC 1001B (RBT-2) replaces WECO 1001B or 1001D (CBT).

Contact your GDC sales representative or call:



**General DataComm Industries, Inc.**  
One Kennedy Avenue  
Danbury, Connecticut 06810  
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## DCA Adds Statistical Multiplexer

NORCROSS, Ga. — A microprocessor-based entry-level statistical multiplexer that is reportedly compatible with other Digital Communications Associates, Inc. (DCA) networking equipment was introduced here recently by DCA.

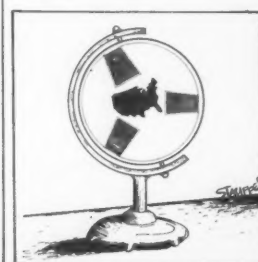
The System 105 is available in two versions. The 105/4 supports two or four ports while the 105/8 supports two,

### Fiber-Optic Units Get More Links

CANOGA PARK, Calif. — Additional interfaces other than RS-232C are now being supplied on a pair of Canoga Data Systems fiber-optic modems.

These interfaces are the MIL Standard 188, RS-422, RS-423 and the CCITT V.35 standard. The interfaces are supplied at no extra cost.

The customer is required only to specify the needed interface at the time the order is placed for either the asynchronous CRS-100 or synchronous CSY-100 modem, Canoga said from 6740 Eton Ave., Canoga Park, Calif. 91303.



four, six or eight ports. Both are claimed to be cost-effective ways to transport computing power to small clusters of asynchronous terminals on a single phone line.

The System 105 operates under DCA's Integrated Network Architecture (INA). It not only can be connected to itself, but it gives the user an upward growth path by being able to connect to every other DCA network and front-end processor or a larger statistical multiplexer such as the System 205/11 [CW, July 16].

The 105 can be upgraded to a System 115 for future network expansion, DCA said.

In a back-to-back configuration, the System 105 serves as

a standard statistical multiplexer. Features in this configuration include optional echoplex for terminal ports and the ability to connect terminals, dial-up modems and host ports at either end.

As a slave unit, the 105 allows the user to extend full-scale networking to small terminal clusters. Multiple 105s can be attached to a single multipoint phone line to further reduce costs.

For each pair of ports ordered with the multiplexers, a module is needed that costs \$325. The System 105/4 costs \$1,150 while the 105/8 costs \$1,395 from DCA at 135 Technology Park, Norcross Ga. 30092.

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## For Publisher of Religious Books Going On-Line Stems Mail-Order Tide

By Walter L. Baines  
Special to CW

GARLAND, Texas — Four years of automation and the experience gained from using two different computer systems has fostered a certain amount of DP maturity for an educational materials supplier here.

Accelerated Christian Education, Inc. (ACE) provides reading programs, textbooks and other resource materials as well as items such as tables and chairs for more than 2,500 schools in the U.S. and approximately 150 educational facilities in 40 foreign countries. In addition, the company offers a comprehensive training program to assist churches in starting Christian schools.

The firm was founded in 1970 by Dr. Donald Howard. In the beginning, it used a well developed and well implemented manual system to fill customer orders.

By 1975, however, the volume became too large to handle economically, and the company installed a Burroughs Corp. L8500 system to handle the administrative and mail-order flood. Projections indicated the machine would last at least five years and present no operational problems.

By 1976, however, — only a year later — ACE had already outgrown the machine and had to modify it to continue using the overworked system.

A one-week analysis of mail orders received toward the end of

the firm's busy season — a total of 2,424 orders for 82,412 separate items — and a sharp look at ACE's operations as a whole revealed that the company's problems stemmed from its order entry methods.

A number of solutions were studied, including contracting with a service bureau, time-sharing, acquiring an in-house computer, using manual systems and expanding the then-current machine.

The idea of expanding the L8500 was abandoned because it could not have provided inventory control. Time-sharing was rejected because it would have necessitated the purchase of an in-house computer for data entry if the transmission time were to be used effectively. The service bureau was rejected primarily because response time would have been inadequate.

This left only the in-house system as a possibility. Still new to the DP game, ACE investigated systems recommended by Digital Equipment Corp., IBM, Honeywell, Inc. Burroughs, Control Data Corp. and various other sources.

Honeywell proposed the most realistic and cost-effective data entry solution. It also took into consideration a built-in field upgrading capability in the event the company's growth should continue at its 30% to 40% rate.

Honeywell recommended on-line data entry via CRTs and delivered eight CRT stations that were linked to a Level 62 computer. An extended program of system analysis, design and program development followed, and ACE was finally ready to go on-line last July.

However, the conversion was not made without some difficulty. Because of the confusion that resulted from swapping files from one computer to another, the Burroughs system operated approximately 12 to 15 hours a day and ran about two months behind scheduled in some processing.

### Feeling the Effects

By the end of July, ACE's computer department began feeling the effects of its beefed-up computerization. As a result of the expanded automation, the

(Continued on Page 54)

## Dema Annual Meet Set In New Orleans Sept. 25

STAMFORD, Conn. — "The 1980s: Years of Growth in Data Entry" will be the theme of the third annual Data Entry Management Association (Dema) conference, to be held in New Orleans Sept. 25-28.

Conference topics will include "Management in the '80s," "Developing Practical Skills Now," "Distributed Data Entry," "Motivation and Communication" and "Hardware in the '80s."

Management sessions will cover stress management, people problems, performance measurement and effective scheduling.

Many companies with names familiar to data entry personnel and others in DP will be represented, a Dema spokesman said, including IBM, Xerox Corp., Nixdorf Computer Corp. and Computer Devices, Inc. In addition to providing speakers, many of these vendors will display their wares at the conference, which is expected to draw an audience of more than 500.

The conference will take place at the New Orleans Hyatt Regency Hotel. It will cost Dema members \$275 and nonmembers \$310. For companies sending teams of three or more attendees,

prices per person are \$245 and \$280, respectively.

Further information is available from Dema at P.O. Box 3231, Stamford, Conn. 06905.

### Offers 21,000 Line/Min

## Univac Unveils Laser Printing Unit

BLUE BELL, Pa. — Univac has introduced a high-speed, off-line, laser-based printer that it said is capable of printing 21,000 line/min. The printer is the third one introduced in the last 15 months to use the laser printer mechanism manufactured by Siemens AG of Germany.

Consisting of a system controller, display console, disk drive, tape system and printing station, the Univac 0777 features 27 different character sets and can print 6-, 8- or 12 line/in, according to a spokesman.

Different fonts can be intermixed on a single line, he noted, and users can generate their own graphics and logos. Both stock and preprinted forms can be accommodated by the use of a forms overlay feature.

(Continued on Page 52)

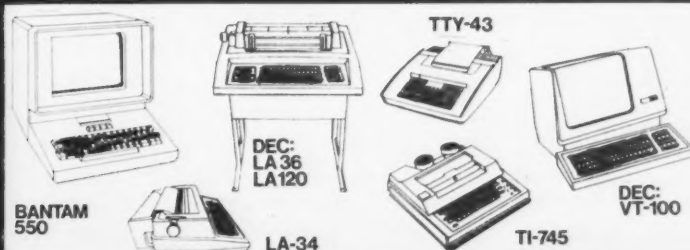


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## More Performance for \$2,000 Less

# Voice Recognition System Upgraded

SUNNYVALE, Calif. — Centigram Corp. has announced an updated version of its Mike voice recognition and response system. The upgrade is said to offer increased performance and flexibility over the previous version as well as a \$2,000 savings.

The updated version, which costs \$3,500, increases the number of spoken words the system can recognize. The standard recognition set has been doubled to two sets of 16 words each. With an optional 16K bytes of random-access memory (RAM), an additional 10 sets can be added.

Users "train" the system to recognize a command or word by repeating it into a microphone several times. When the system has performed its analysis of

the sound, it proceeds to the next word until all 16 of a set have been learned.

One of the additions to the system permits up-line storing and down-line loading of a previously learned vocabulary, obviating the need to retrain the system each time. With this approach, vocabularies for several speakers can be stored, a spokesman explained.

When appropriately programmed, the unit responds to a command with an audio message up to 8 sec long.

In addition to these enhancements, Centigram announced it is offering components of the system to OEMs. An electronics-only version (printed circuit boards) sells for \$2,850, while a recognition-only configuration of boards sells for \$1,750.

The unit features RS-232C serial and 8-bit parallel ports, so it can connect to a wide range of mainframes, Minicomputer and microcomputer, the spokesman added. The 16K RAM option costs \$350, he said from Suite 108, 155A Moffett Park Drive, Sunnyvale Calif. 94086.

### Correction

"Datapoint Packs Six ARCs Into 'Starter Kit' for DDP" [CW, July 2] contained several errors. The ARCpac is one system consisting of six Attached Resource Computers. It comes with five (not one) 1,920-character CRTs, as well as five typewriter-style keyboards. The correct model number for the 20M-byte disk is 4734.

## Plotter Offers Eight Colors

SUN VALLEY, Calif. — The Model 281 recently introduced by Soltec Corp. is an intelligent digital plotter that can produce plot with up to eight separate colors.

The plotter, which can attach to microcomputers and minicomputers as well as mainframes, has a maximum plotting speed of 30cm/sec on a plotting area of of 280mm (Y-axis) by 360mm (X-axis). Plotting accuracy is 1% of full scale, with linearity of more than .1%, a spokesman claimed.

One special feature of the unit, not commonly found on plotters, is a scale variation ability that lets users do up- or down-scaling to accommodate plots that are less than an optimal distance from the central point of a graph. This automatic scaling capability is possible without a change of programs, the spokesman noted.

The Soltec 281 plotter costs \$4,725. OEM discounts are available, the firm said from 11684 Pendleton ST., Sun Valley, Calif. 91352.

# 10 (of the 100) EDP installations in Tulsa.

American Airlines  
Amerada Hess Corporation  
Bank of Oklahoma  
Cities Service Co.  
Getty Refining and Marketing Co.  
Rockwell International  
Shell Oil Co.  
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A central location from a geographic and communications viewpoint.  
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Full integration into AT&T's Digital Data System network.

### Trained EDP Personnel:

All levels, keypunch operator to EDP management.  
Local universities with strong computer curricula.

### Support/Service:

Supplies/maintenance through many manufacturers' reps, plus support from technical service companies.

### The Computing Community:

Tulsa's total EDP memory capacity tripled (to 147.5 million bytes) between 1975 and 1978.  
Virtually all major users here plan further expansion.  
A sophisticated EDP community, in a moderate-sized city.

### Quality of Life:

Average commute 10-15 minutes; major lakes within 30 minutes of downtown.  
Two major national surveys rated Tulsa "above the 90th percentile" in quality of life.



## FREE:

Independent evaluation of Tulsa data processing capabilities by the Stanford Research Institute (SRI) and directory of Tulsa installations.

Write or call John Degitz, Manager/Marketing, Economic Development Division, Metropolitan Tulsa Chamber of Commerce, 616 South Boston, Tulsa, OK 74119 918/585-1201

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ECONOMIC DEVELOPMENT COMMISSION OF TULSA

## Univac Unveils Laser Printer

(Continued from Page 49)

The Univac 0777 produces a constant 159 page/min — regardless of print size — on 11-in. paper, the firm said. The unit can stop or restart printing, display statistics, create and modify files of print information or recover in the event of a system error.

The printer can provide multiple copies (up to 255) with no operator intervention, the spokesman claimed. Print line length can be a maximum of 13.6 in.; since the unit can print at 10-, 12- or 15 char./in., the maximum number of char./line is 204.

Options available with the Model 0777 include a burster/trimmer/stacker feature, additional 10M-byte disk, additional magnetic tape drive and a hard-copy printer console.

A copy modification feature on the unit permits selected lines of selected pages to be suppressed or changed. In addition, the unit provides automatic job separation marking.

The system supports the standard magnetic tape formats of the firm's 90 and 1100 systems, the spokesman said.

First deliveries of the \$364,000 system, which will lease for \$7,000/mo on a five-year agreement, are scheduled for the second quarter of 1980. Maintenance for the basic system is \$758/mo, plus a charge of .0029 cent/ft for paper usage.

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312-698-3000

## Along With Sheet-Feeder, OCR Reader Two Printers Among Additions to Lexitron Line

CHATSWORTH, Calif. — Lexitron Corp. has enhanced its product line with the addition of two printers, a paper-handling attachment, an optical character recognition (OCR) reader, paper tape-handling software, communications options and a field retrofit that allows users of its cassette-based Videotype products to upgrade to diskette storage.

The company also announced a facility that permits on-line connection of the firm's VT-1000 word processors to the Bowne Information Systems, Inc. time-sharing service.

A wide-track daisy-wheel printer that can print 264 columns on a single line costs \$5,600. Another printer, also bidirectional but with two printing elements, permits the intermixing of two type styles and/or ribbon colors on forms up to 26 in. wide, Lexitron said. That printer sells for \$6,750.

The sheet-feeder introduced by the subsidiary of Raytheon Data Systems Co. can accommodate up to 180 sheets of paper in sizes up to 11- by 14-in. for applications in which continuous forms are not suitable. That enhancement costs \$1,800.

The OCR unit has a throughput rate of 1,000 char./sec, the firm said, and an error rate of less than one character per 150,000. OCR-A and OCR-B fonts in several

versions are supported by the \$17,350 unit.

The communications software package, priced at \$250, supports TWX, Telex and International Telex protocols on Lexitron's word processing systems.

Several communications options introduced by the firm extend the range of communications supported by its

VT-1000 and Videotype products to 2741-, 2780- and 3780-type devices, including both asynchronous and synchronous, point-to-point network functions. Prices for these options range from \$1,450 to \$1,850.

All asynchronous options are scheduled for fourth quarter availability, while all bi-synchronous options will be

available by the first quarter of 1980. Point-to-point asynchronous options are available now.

The company recently demonstrated its Raytext System, which combines the Lexitron 1202 or 1203 word processors with a Raytheon Data Systems PTS/1200 distributed processing system. That system, which the firm said

would be available in pilot versions soon to selected, leading-edge users, performs both data and word processing.

It provides a shared file with a capacity of up to 250 million characters, the firm noted, and supports communications over dial-up or dedicated lines to IBM mainframes, Lexitron said from 9600 DeSoto Ave., Chatsworth, Calif. 91311.

### Datapoint just opened a local service office in Lafayette, Louisiana. It's one of 42 new ones we opened this year.

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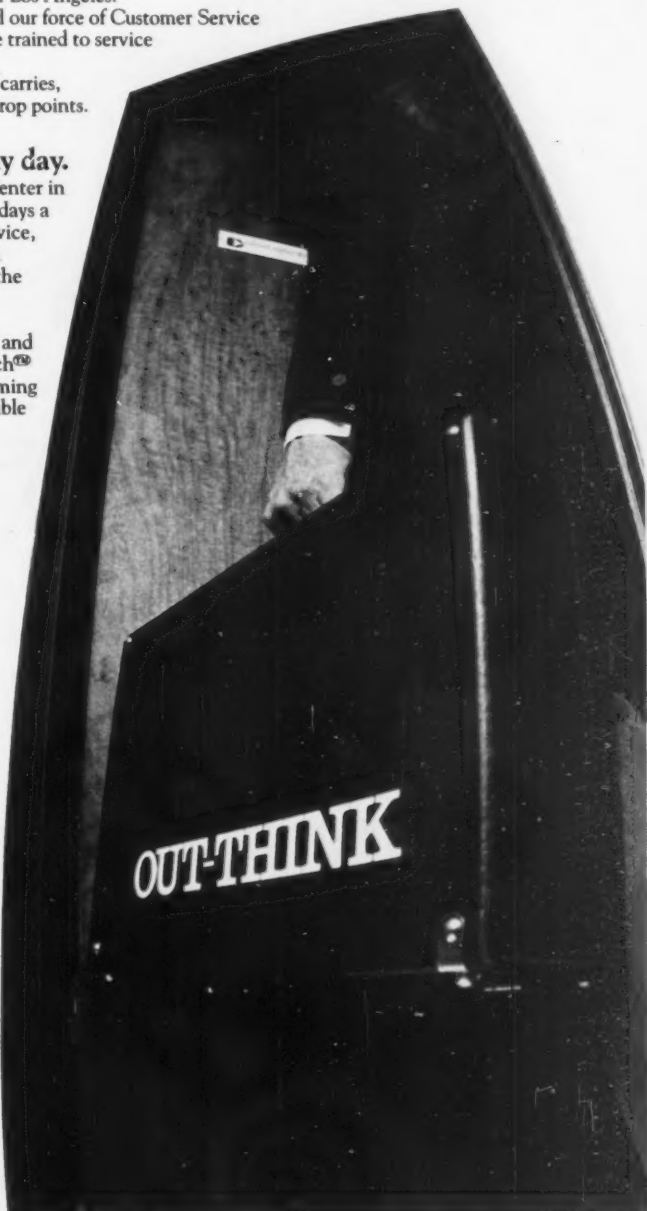
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If you'd like to know more about Datapoint, its hardware, software, or service, please write Marketing Communications Dept. (M-62), Datapoint Corporation, 9725 Datapoint Drive, San Antonio, Texas 78284.

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**HP 3000** The HP 3000 Family is Hewlett-Packard's most powerful business computer line. Both the Series III (pictured above) and the Series 33 use MPE-III, a multiprogramming operating system that facilitates on-line transaction processing at terminals throughout your company. The Series 33 (which can support up to 32 terminals) is priced from \$58,500, while the Series III (64 terminals) starts at \$105,000.

**HP 1000** The HP 1000 Systems Family consists of five upward-compatible models (from \$20,000 to \$100,000) designed to meet the diverse needs of engineering and manufacturing environments. All use HP's powerful RTE operating systems, and the HP-IB interface bus lets you monitor and process data from over 200 Hewlett-Packard instruments.

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# Honeywell Slates Security/Privacy Seminars

PHOENIX — Honeywell, Inc. will resume its series of workshops on computer security and privacy this fall with four workshops focusing on distributed systems.

The three-day workshops will be conducted by Jerome Lobel, Honeywell's manager of computer security and privacy education, who originated the workshops.

Each workshop will examine the planning necessary for a

more secure system and will use the case study method. Topics will include security responsibility, risk analysis, operations security, internal computer security, physical security and computer auditing.

Also scheduled are examinations of system monitoring and surveillance, disaster recovery planning, privacy legislation and network security.

The workshops, to be held at

the Sheraton Greenway Inn here, cost \$450, with a \$50 discount if payment is made 30 days prior to the start of a workshop. An additional \$25 discount per person is extended to teams of two or more from the same company whose preregistration and payment are received 30 days before the workshops.

The dates of the workshops, which are aimed at DP managers, auditors, financial executives and security directors

of businesses and government agencies, are Sept. 18, Oct. 16, Nov. 27 and Dec. 11. Additional information is available

from Lobel at Honeywell, P.O. Box 6000, Mail Station T99, Phoenix, Ariz. 85005.

## Religious Book Publisher Stems Mail-Order Tide

(Continued from Page 49) educational supplier modified its programming to eliminate the need for entering the basic

academic subject topics — math, social studies, english and science — into the system individually.

This meant that only 544 items were verified by hand and only totals had to be entered into the machine for billing purposes. Direct order picking was done from a copy of the customer's original order.

Even though ACE did not have total inventory control, the firm had enough to supply a set of statistics more valid than the ones derived from the earlier study. The company had a high of more than 5,000 orders in a one-week period, with a total number of line items in excess of 70,000, excluding approximately 70% of the line item volume in the four basic subjects.

This reflected an increase in the number of customers as well as an expansion in the number of line items ACE was carrying.

### Mark Reader Next

By now, the firm was becoming more professional in DP management and had expanded its Honeywell system in preparation for the 1979-80 school year. The system now had a total of 388K bytes of main memory with 320M bytes of on-line disk capacity and an 800 line/min printer.

Even with this upgrade in equipment, however, it became obvious that ACE could not handle its orders for the next school year on a timely basis.

Another study of data entry alternatives was undertaken that resulted in the acquisition of a National Computer Systems, Inc. 7010 optical mark reading system.

The mark reading system has the advantage of being virtually error-free. It also keeps track of total inventory control and sales activities. The machine scans both sides of an order blank simultaneously, reading a maximum of about 3,000 sheets an hour in an off-line mode.

The major disadvantage of adding the optical scanner was creating another order procedure change for the customers as well as significantly reprogramming the computer routines. However, the long-range benefits and advantages, plus the cost considerations, tip the scale in favor of this type of computerization.

Baines is manager of DP at ACE.

## The Harris fiber optics digital data link. It's fast, has room for 32, and gets great mileage!

If you're looking at digital data links right now, or will be in the future, fiber optics could be the ideal choice.

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Computer or peripheral I/O can be supplied as RS 232C, MIL STD 188C, or others.

Before you specify a digital data link, consider the cost (\$12,000 plus cable), and performance of the Harris 32 channel fiber optics link. When you combine its tremendous speed, line capacity and distance capabilities with the highly competitive cost advantages, the new Harris digital fiber optics link is the best solution to your interconnect needs.



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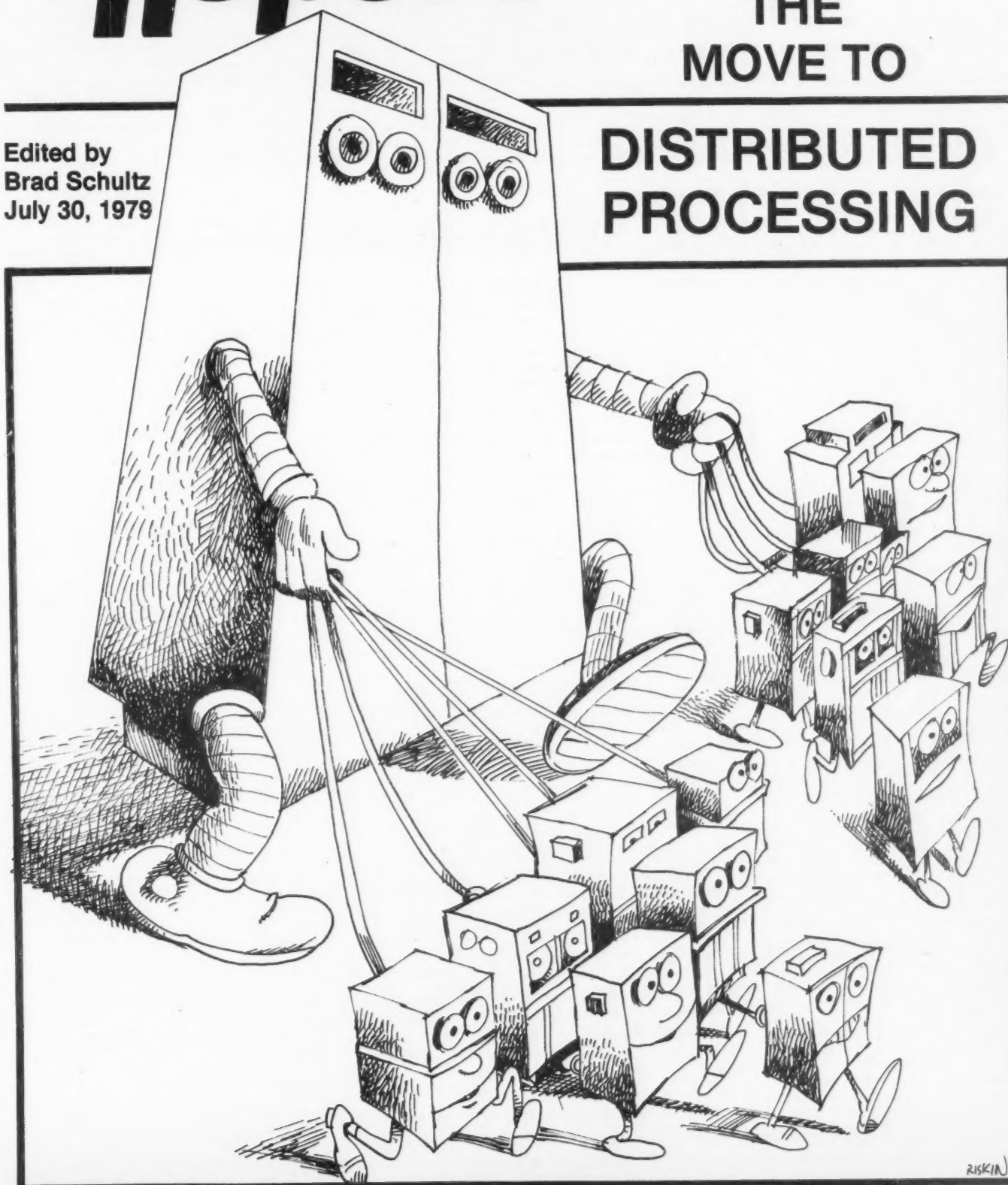
COMPUTERWORLD 

# Special Report

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MOVE TO

Edited by  
Brad Schultz  
July 30, 1979

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# Data Base Architectures a Problem

## DDP Has Advantages, But Obstacles Persist

By Hal B. Becker  
Special to CW

From its inception, the computer industry pursued and promoted a policy of centralization. It promised larger, faster, less expensive mainframes that would deliver apparently unlimited computational power to far-flung clusters of users from a single, centrally located installation. The "bigger is better" syndrome rolled along, unchecked for almost two decades.

The objectives of centralization were many. Elimination of the multiple, independent, dissimilar installations unable to communicate or cooperate with one another was one frequent goal. Another popular cause was the sometimes mythical "economy of scale" that centralization offered.

The mid 1970s produced an alarming awareness: pursuit of the economy of scale through centralization regularly resulted in confrontation with the complexities of scale inherent in the approach. A number of huge installations capable of measuring disk drives and tape handlers by the acre appeared, giving not so mute testimony to the "advantages" of centralization.

A logical reaction to the complexity of scale and other related problems resulted in the early investigations of what is now known as distributed DP (DDP).

### Basic Building Blocks

And a reasonable level of agreement appeared on the definitions of three basic building blocks common to all

information networks, whether the classical centralized or the newer distributed. "Information processing" is defined as the manipulation of information to produce the desired result. "Network processing" (data communications) controls the flow of information between the numerous, geographically separated nodes of the network. "Data base processing" is the storage of potentially large volumes of information in forms appropriate for use by the network and its users.

The distribution of these three network building blocks really began in the middle 1960s when the first data communications (network) processor was configured as a remote concentrator. This technique provided clusters of terminals with efficient, cost-justi-

fiable levels of access to distant computational resources.

Shortly thereafter, the information processing function was distributed in the form of remote batch or remote job entry processors. This left the data base as the sole remaining centralized function.

### Applications Migration

The broadening spectrum of the computer user community and its increasing dependence on timely, accurate information produced a very visible migration of applications from the traditional batch world to the evolving on-line or event processing environment. This migration frequently required that a data base, or portion thereof, also move on-line.

Classical data base architectures are not well suited to distribution.

Before truly distributed configurations can be readily available with standard, off-the-shelf vendor products, two fundamental obstacles must be overcome:

- Systems intersecting through a common network tend to treat each other as subservient terminal devices rather than co-equal processing resources.

- The problems associated with large, centralized data bases — conflicting updates, concurrent access, reconciliation, "deadly embraces" — become far more complex when the function is distributed.

These obstacles persist because operating systems and data bases are currently structured around the classical, centralized DP philosophy.

But the production of mature, efficient distributed operating systems and data base architectures is not a trivial exercise.

A number of large users facing the complexities of scale in their growing centralized facilities are exploring increased levels of functional distribution. Several planned installations will have multiple, interconnected, geographically separate, co-equal processing and data base resources. These users tend (or perhaps are forced) to have a higher level of pioneering in-

(Continued on Page SR/16)

## In Second-Generation DDP

### Hosts Considered as Peripherals

By Gary Sharpe  
Special to CW

Strong evidence suggests that we are now entering the second generation of distributed DP (DDP). As we do, it will be invaluable for us to establish clear criteria for systems that are essentially terminal-based and oriented toward the user.

We are now moving beyond the time when DDP merely meant that we could perform functions such as data entry, batch processing and interactive computing in a remote as well as centralized environment.

The "replacement phase" can be seen as the first generation of DDP, and most observers would probably agree that the major problems of that era have been solved.

The second generation is characterized by a focus on putting more and more power at the local level. The driving force behind this change is the ability to make terminals increasingly sophisticated in a cost-effective, user-transparent way. Network designers now conceptualize the host/terminal relationship in a different way.

The difference is so radical, in fact, that the designer of second-generation terminals now begins to see the host as a peripheral. The terminal becomes the essential point of reference and the user goes from the terminal to the host when it needs certain functions performed, rather than vice versa.

### Human Factor

Another factor to consider as we begin to design second-generation systems is that human factors influence the change as much as technology or economics. The end user is being given the opportunity to interact directly with hardware and software in an entirely new way.

Formerly, the end user had to deal with the DP domain at arm's length. He was only allowed to drop off his data for processing like shirts at the cleaners. But today's user understands what he wants and may push DP manager and equipment vendors faster than they are prepared to go.

It is useful to bear in mind that people in the field know more about their data than processing it, while the peo-

ple at the central site know a great deal more about DP and less about the data itself. This means that more and more of the functions a DP professional once would be expected to perform at central facilities — such as knowing how to log onto a host — must be performed by applications programs and by the equipment itself.

### Basis for Evaluation

With these general concepts in mind, what should you consider in evaluating or designing a terminal-based system? In my view, there are several basic criteria:

- The system should be multifunctional. It should be capable of handling diverse activities and functions including local processing, host interaction and remote job entry. Local format storage, local printing and the ability to access and update local data bases should be available.

In keeping with the concept of the host as peripheral, an applications program should be able to make the necessary decisions on when the host should be accessed for infrequently used data or for special functions not

available in the terminal system.

- The terminal should perfectly emulate the terminal systems provided by major mainframe manufacturers. When a communications transaction with the host computer is required, it should be possible to use existing facilities and applications programs without costly modification.

This means that the system should be able to emulate IBM 3270 terminals, 2780 batch, 3780 batch, Hasp remote job entry and Synchronous Data Link Control batch/interactive protocols to allow for flexibility and future growth.

- The system should use a language specifically designed for DDP.

Most of the standard programming languages in use today were written for the purpose of batch processing and simply do not work well in a distributed mode. These languages are too cumbersome and inefficient when adapted for interactive screen processing.

The language should be especially efficient in data moves and field manipulation. Communications read and write macros are also of great value. You

(Continued on Page SR/22)

## Inside

DDP Has Advantages, But Obstacles Persist .....	SR/2
Hosts Considered as Peripherals .....	SR/2
Distributed DP Provides for Local Data Needs .....	SR/3
DDP Entails Change of Management Style .....	SR/4
Time-Sharing Critical Factor in DDP Growth .....	SR/5
DDP Viable for Airline Maintenance Operation .....	SR/6
Corporate, DDP User Needs Must Be Balanced .....	SR/7
IBM 8100 and 4300 Aimed at Different Users .....	SR/10
Distributed Minis Aiding Solar Energy Tests .....	SR/11
Net Boosts Western Electric's Order Control .....	SR/12
DDP Offers Challenge to Managerial Expertise .....	SR/18
Hyatt Hotels Moving to Decentralized DP .....	SR/23
Independent Realtors Benefit From Network .....	SR/26
DDP a 'Natural' for Publishing Applications .....	SR/29

# Distributed DP Provides for Local Data Needs

By Frederick H. Wu

Special to CW

It is generally recognized that DP should be centralized to achieve economy of scale. This recognition is based on the assumption that the major investment in a computer system is the mainframe or the CPU. If a firm has committed much of its funds to the CPU, it will certainly attempt to maximize its utilization, and the centralized DP concept is logically consistent with the goal of utility-maximization.

However, just like the data base concept, centralization tends to disregard people's feelings and needs. The systems people decide how and what information is to be produced. The user simply accepts what is given.

This problem naturally leads to the concept of "distributing" the information processing resources across two or more geographically separated locations within an organization.

To a great extent, the distributed concept in DP is equivalent to the concept of "responsibility accounting," which recognizes various decision centers within an organization and attempts to provide information relevant to each individual decision center.

Stated differently, each level of management has different information needs, and responsibility accounting can satisfy them. By attempting to meet the information needs of various decision centers or various levels of management, the distributed system forces the total information processing resources of a firm to be located at various decision centers.

DP functions may be divided into three areas: data base (files) processing, information (computer applications) processing and communication processing (data transmission between two geographically separated locations).

Under the traditional batch concept, those three functions are combined and centralized. With real-time systems, data base processing is decentralized, allowing messages to be collected at various remote locations and transmitted to the CPU location. With distributed systems, data base processing and information processing may also be distributed.

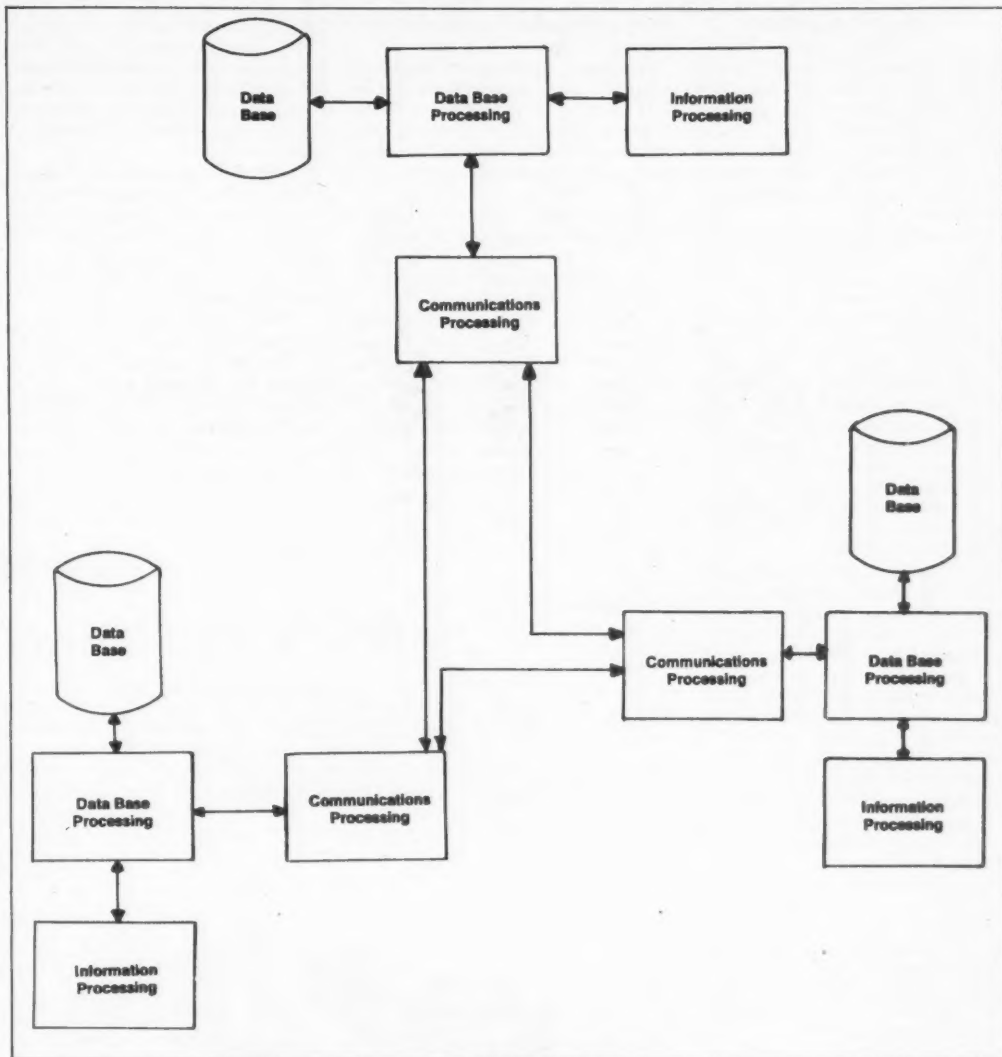
## Multiple CPUs

To allow the distribution of information processing, multiple CPUs must be used, with each location (a decision center) having its own local CPU. Each local CPU, called a node, can process local data to satisfy the needs of the local management. If there is a central node with a greater processing capability, any job that the local node cannot handle will be assigned to the central node.

Each local node is linked to its data base, which may be a copy of the central data base. The local data base may also be completely unrelated to and different from other data bases in a so-called "partitioned" data base scheme. The accompanying figure shows a complete distributed system.

But distributed systems are not a panacea for every organization. They are most appropriate for use in the following situations:

- When large volumes of data originate in many locations and fast access to that data is required. Data at various local terminals needs to be gathered,



Completely Distributed System

summarized and transmitted to the central node quickly.

A good application would be in store chains, an example of which is the distributed system of Lowes Company, Inc., a chain of 140 retail lumber/hardware stores located in the southeastern U.S.

- When fast access to large volumes of centrally created and maintained data is required. A possible application of this is the centralized production scheduling of Celanese Corp., a large U.S. textile manufacturer with a number of geographically dispersed facilities with principal locations at Charlotte, S.C. and Shelby, N.C.

- When the local node maintains a partitioned data base, and the central site maintains a complete data base. Aeroquip Corp., a manufacturer of fluid power components, employs a distributed system whose objective is to provide on-line order processing, inventory control, credit checking and shipping documents to facilitate shipping most orders within 24 hours after receipt.

Instead of employing a large operating system at the central node, a distributed system has much localized software, which may include a data base supporting a batch-oriented or real-time operating system. The degree of software sophistication depends on the

hardware configuration. In general, however, the high cost of software in distributed systems limits their use to large companies.

## Pros and Cons

The distributed system is the latest fashion in computer system technology. The "distributed" concept has dramatically and suddenly changed the system design philosophy. No longer is it necessary that DP facilities be centralized.

Instead, each business operation center can have a computer system of its own and use a communications system that links the local systems to each other. This sort of arrangement is very attractive to most end users, but does not suit all of them.

Compared with the centralized systems, distributed systems have the following advantages:

- Under local direction, the system is flexible.
- The system is more responsive to the user.
- Systems analysts are more responsive to user problems, personnel and requirements.
- Some claim that, once installed, distributed systems using minicomputers have lower operating costs, particularly for on-line and real-time systems in which a large CPU bears all

overhead costs.

- Distributed systems are ideal for implementing real-time applications.

- Cost control is more effective at the local level where costs are small and manageable as a line item on the division manager's fiscal plan.

- Since a system failure in one node does not affect the others, the system as a whole is more reliable.

On the other hand, there are disadvantages:

- The initial costs of a distributed system's software and hardware may be too high for the approach to be considered viable by management.

- The audit of a distributed system is difficult and costly.

- Having a smaller computer system at each node generally means not having personnel with the skills and experience to select the hardware and software and to deal with the hardware and software vendors.

- Because there is a smaller DP staff at each node, personnel turnover can make the local system vulnerable.

- Friction between the local DP staff and the central headquarters' staff may arise when the latter attempts to enforce the policy of uniformity in systems design.

Wu is an associate professor of accounting at Wichita (Kan.) State University.



# DDP Entails Change of Management Style

By Jagdish R. Dalal

Special to CW

One of the scientists involved in unraveling the mysteries of the Three Mile Island nuclear accident made an astute observation. He said, "Maybe three out of the 10 things that went wrong with the reactor were mechanical in nature. The other seven were human errors."

"Now we will spend tens of millions of dollars in researching and designing better mechanical systems, while all but ignoring the human aspects."

This observation applies equally well to any high-technology field. Companies spend millions of dollars planning, designing and implementing distributed data processing (DDP) hardware and systems, while the human aspect of DDP becomes a secondary issue or is ignored altogether.

Yet distributing computer power through networking creates some new and important problems for DP managers.

"Make no mistake about it, managing tomorrow's system requires a distinctly different management outlook," C.W. Spengle, the president of Honeywell, Inc., has noted. "With older systems, it was possible to see everything from a single vantage point. Years ago, it was all in the machine room."

## Manager Characteristics

Let's review some characteristics of the user manager that can have a direct impact on his attitude toward distributed processing.

First, there is resistance to change. All people resist change. Whenever a new form of operation is indicated, there will always be forces both supporting and resisting the transition.

Such problems can often be tackled using a method developed by Kurt Lewin called Force-Field Analysis. This method analyzes the forces and identifies them and reduces the resisting forces while increasing the driving forces.

Second, there is fear of technology. Computer technology is changing so rapidly that it is difficult even for computer professionals to stay abreast of developments. This constant change breeds fear not only of the unknown but of inadequacy in managers on the periphery of such change.

Then there is fear of complexity. Life without computers was well-defined, paper-oriented and simple in the minds of many user managers. Systems have given rise to a complexity that seems beyond their control, provoking a fear of complexity that is sometimes aggravated by poor communication among DP professionals.

Finally, there are active vs. reactive management styles. Many user managers experience great difficulty adjusting to the participatory, active roles assigned them in a distributive environment. Distributed processing creates autonomous work groups that force managers to involve their subordinates in decision making. Perturbed by these effects, many users become reactive.

## Avoiding Strain

When distributed processing is introduced in a user function, the organizational structure should be thoroughly studied. Otherwise, strain will result

from the merging of computer technocrats with users.

The theory of personnel dynamics, especially peer group formation, must be studied in this light. Otherwise, the user function will be subjected to a split organizational structure that tries to move in several opposing directions at once.

Communication skills are important in any organization, but even more so in a DDP environment. The need for effective communication derives from the organization's need to:

- Identify common objectives and goals.
- Establish requirements and plans.
- Establish working relationships.
- Rely on distributed processing.

Motivation in a distributed process-

ing environment becomes a challenge. Greater attention must be paid to career path planning and advancement opportunities, requiring the involvement and commitment of more than one function within the distributed network.

If a systems specialist's need for peer group recognition goes unsatisfied, he will not be motivated to get that "last nanosecond" out of the machine. This applies to all DP professionals who, as a group, are generally motivated by peer group recognition.

A skills development mechanism is also necessary to ensure motivation in a distributed environment. Many good systems analysts have come from the programming ranks. But this skills development process requires good plan-

ning and a strong training and development program.

Further, managers should provide subordinates with feedback and with the opportunity to participate in policy-making.

Finally, it is imperative that the principles of job design be studied and effective methods be devised to implement them. All of the common methods of job design, including rotation, job enlargement and job enrichment, are more difficult to implement in a distributed setting.

The establishment or transition to distributed processing may seem easy from the technological point of view. However, if the personnel aspects are not considered, distributed processing

(Continued on Page SR/7)

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# Big Impact on System Evolution

## Time-Sharing Critical Factor in DDP Growth

By Robert F. Hargraves Jr.

Special to CW

Distributed data processing (DDP) has become a popular topic of discussion in the past several years, but we should understand that the issues raised in regard to DDP are not really new. Indeed, the issues are not even unique to the computer era.

Information processing has never existed in a vacuum. It has always been a social function. Society has been organizing itself to process information ever since it became important to know how many sheep one owned or how many days remained until the spring planting.

In this context, the relative balance

between distributed and centralized processing has depended partly on the competing goals of those needing the information and partly on the technology available to implement those goals. When technology is available to serve those needing centralization, the balance tends to shift in that direction. When technology becomes available to serve decentralized goals, the reverse becomes true.

We should also understand that these relationships tend to oscillate over time. Prior to widespread implementation of computerized DP, for example, manual "distributed processing" was the order of the day because of the technical barriers to gathering, pro-

cessing and storing large quantities of information on a centralized basis.

With the advent of new storage technologies in the 1950s and 1960s, the balance shifted toward a centralized mode. A trend toward corporate concentration through consolidation and merger as well as growth toward centralized governmental power was established.

Today, with memory prices plummeting and labor costs rising, it makes good economic sense to distribute back toward the field, reducing large support staffs at the center as increasingly less sophisticated users go on-line at the periphery.

Not only does this trend fit economic

reality, it also supports a growing demand for autonomy, creativity and decision-making power within local units of large organizations. The role of time-sharing in information environments which are becoming increasingly decentralized is important because of the early and consistent impact of time-sharing on computer evolution since the 1960s.

### Functionality and Implementation

It is of course possible to "share time" on a computer in a number of different ways. When we talk about time-sharing, for example, we may really be talking about interactive computing, in which a number of users are simultaneously on-line and interacting with the computer from terminals.

Technically, we could also be talking about a number of jobs being run in a batch mode simultaneously. Both would be time-sharing, but the difference in interactive computing and batch processing is enormous in terms of user experience.

In my view, it is the distinction between interactive computing and batch processing that should be emphasized rather than the focus on distributed vs. centralized processing.

Interactive computing refers to an experience in which the user and the computer work together without intermediaries to solve a significant problem. The interaction between human and machine is immediate and intense, resulting in a relationship which is both creative and intimate.

Batch processing is, in a word, different. Batch processing is valuable, and that is why we included the function in designing the Dartmouth Time-Sharing System (DTSS). However, the user's relationship to the machine is less immediate and more distant and usually involves other people. In our development of the DTSS operating system, we have focused on creating an easy-to-use system with interactive capabilities as the dominant theme.

From the user's point of view, we have functionally provided a distributed environment where geographically dispersed users can enter and receive data directly from terminals at their sites. Implementation details have determined whether the actual processing of data has occurred at a local minicomputer, intelligent network or centralized corporate data center.

Thus, functionality and implementation represent two other variables to consider in looking at a distributed system. To some extent, these two variables mirror and expand upon the insights provided by the distinctions between interactive computing and batch processing.

For example, we can easily envision a minicomputer-based system which is physically distributed but functionally batch processing-oriented. Similarly, we can envision a mainframe-based system which is physically centralized but functionally oriented toward interactive computing.

### Distribution and Integration

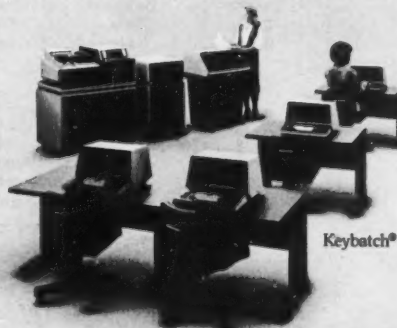
As in the past, we expect the balance between centralized and distributed processing to shift according to economic needs and the technology available.

(Continued on Page SR/16)

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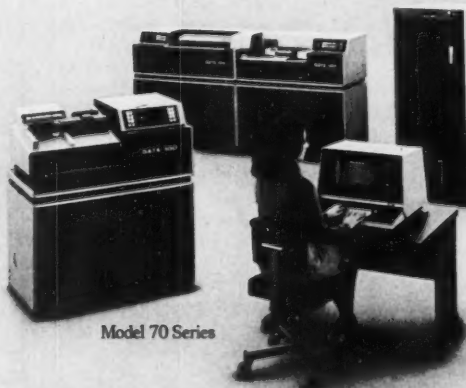
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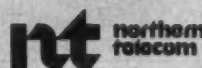
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# DDP Viable for Airline Maintenance Operation

By Keun K. Lee

Special to CW

In the 1970s, many large users have significantly reduced their DP costs and improved the efficiency of their applications by centralizing data bases, processing activity and systems development.

But centralization has spawned complicated systems and applications software that have proved inflexible and difficult to use, extending the time needed to maintain or enhance a system. By creating bottlenecks at the output facility, centralization has also made timely reporting of computer-stored data virtually impossible in some cases.

Furthermore, frequent turnover of DP personnel has made it more difficult to keep systems maintenance in compliance with management policy. And the estrangement of central DP and strictly user personnel has hampered communications between these two groups.

The demand for distributed DP (DDP) stems from the end user's need for timely information as a decision-making tool and for more flexibility in applications systems. The demand is also stimulated by the falling cost of hardware and the development of powerful communications network architectures.

## Applications Areas

The definition of systems application areas is essential to the success of DDP. The analysis necessary to make such definitions may be performed by using a matrix that shows how groups of data and managerial functions relate to each other. This approach, demonstrated in Figure 1, may prevent duplication of a data base or application.

Most maintenance and engineering divisions in the airlines industry are equipped with aircraft maintenance, parts production, inventory management, technical support, quality assurance, facilities management and planning functions.

Quantitative analysis, which applies engineering, mathematical and statistical techniques, is often required in many highly diversified functional areas. This common need makes centralization of the data involved in quantitative analysis a desirable approach for many users.

But there are alternative methods of applying computer resources to an airline company's maintenance and engineering division. In a distributed network, time-sharing capabilities can be allocated to various node sites endowed with an interactive programming language.

Another approach is to place a mini-computer at each node and link these minis to the central mainframe. This arrangement is likely to prove more reliable and flexible than time-sharing because under the latter scheme, the nodes become inoperable when the central system goes down.

## Functional Supports

To develop and implement either type of distributed processing system, two functional supports may be necessary. The first function, shown in Figure 2, is for organization of central DP; the second function, shown in Figure 3 (see page S/22), is for the maintenance and engineering division.

Characteristics of the first function include:

- Hardware and software (operating system, compiler, utilities) supports to the local user.
- Analysis of reliability and cost efficiency of the local configurations.
- Development and maintenance of application systems or programs for data base exchange between central and local sites.
- Documentation and control over application systems and programs for data base exchange.

(Continued on Page SR/22)

		Data Base					
		A	B	C	D	E	F
Functions supporting Managerial Decision-Making	1	x	x	x			
	2	x	x				
	3				x	x	x
	4				x		x
	5		x			x	x

Figure 1. Interrelationship matrix identifies two application areas. This approach may prevent possible duplication of data base or application system.

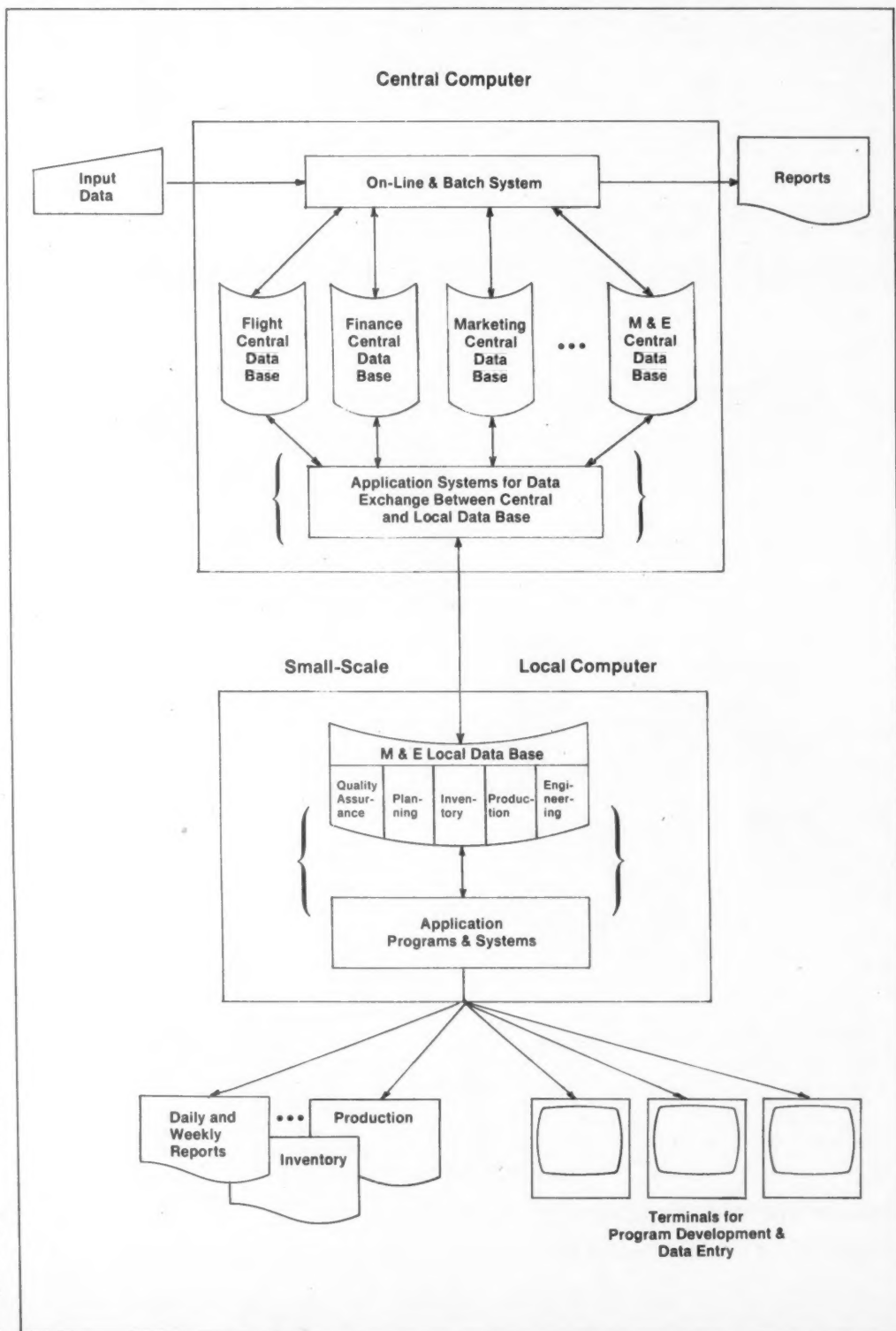


Figure 2. DDP System Using Time-Sharing Capability

# In Optimizing Processing Levels

## Corporate, DDP User Needs Must Be Balanced

By James S. McGuire

Special to CW

Presumably, the primary beneficiary of distributed data processing (DDP) is the end user. In large organizations, this may be the head of a department, division or plant. He has a growing need for DP that is, for the moment, met to some degree by internal computing, services purchased from outside or some combination thereof.

The goal of any distributed processing system is to provide this end user with easy access to and control of his own information. It should give him the timely data needed to run his operation more effectively and efficiently.

As with most generally stated goals, there are a few pitfalls and potholes on the road to success. For distributed processing, the most critical of these involve the meeting of some essential requirements.

The most basic of these is the need to put an appropriate level of processing capability at any part of the organization that needs it — without interfering with the corporate DP objectives and requirements.

### Accommodate Growth

This appropriate level of capability should be measured in terms of future as well as current requirements. Hence, any candidate system should be able to grow to meet future needs; this growth should be accommodated in sensibly priced increments.

Again, the appropriate level should be measured not merely in terms of CPU and peripherals capability, but also in terms of the end user's work load and application mix.

The user should consider whether the applications are primarily batch-oriented or involve data collection and communications. Or possibly interactive use is the most important criterion by which to select a system to serve present needs.

A final measure of the appropriate level of processing capability involves software. In the current marketplace, all too often the user is required to pay for a full complement of systems, support and applications software, regardless of whether it is truly needed. Users can choose unbundled software and separately priced software packages to fill their particular requirements.

Besides furnishing the appropriate level of processing at each node, the

successful distributed network must also avoid interference with the corporate information processing system. The latter aspect is equally important and every bit as tricky.

Local end user control sounds wonderful. But much of the information generated at this level may be needed for corporate management information systems. Suddenly the issues of communications protocol and software compatibility loom large.

Again, from the standpoint of corporate requirements, a second basic need to be met by distributed processing is the ability to link in a single network groups of compatible processors of varying capabilities. These range from

remote job entry (RJE) stations through intelligent terminals to general-purpose minicomputers or small-scale mainframes.

One of the advantages of meeting this requirement is that it allows the sharing of DP resources to minimize investments in software development as well as in hardware. Software portability is a critical issue if previous software investments are to be protected.

### Systems Image

Finally, the maximum effective use of all the nodes at several levels of capability should allow the local nodes to use programs and share data bases that have been developed and are operated

on by the host and by other nodes. An important requirement: *For any user at any level, there should be a single systems image.*

The major hurdle in developing an effective distributed processing system is to provide the end user with the control he needs over his own DP resources. The system must furnish an integrated network of compatible processors of many levels of capability — all of them under intelligent, coordinated corporate control.

McGuire is president of the Computer Division of National CSS, Inc., a remote computing services company based in Norwalk, Conn., that became a mainframe vendor last year.

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OTHER INCOME, NET	10,873	16,810	20,787	
	\$1,929,861	\$1,703,506	\$1,404,229	

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OPERATING REVENUES	\$1,918,988	\$1,686,696	\$1,383,442	\$1,163,204	\$1,013,357
OTHER INCOME, NET	10,873	16,810	20,787	13,005	12,956
	\$1,929,861	\$1,703,506	\$1,404,229	\$1,176,209	\$1,026,313

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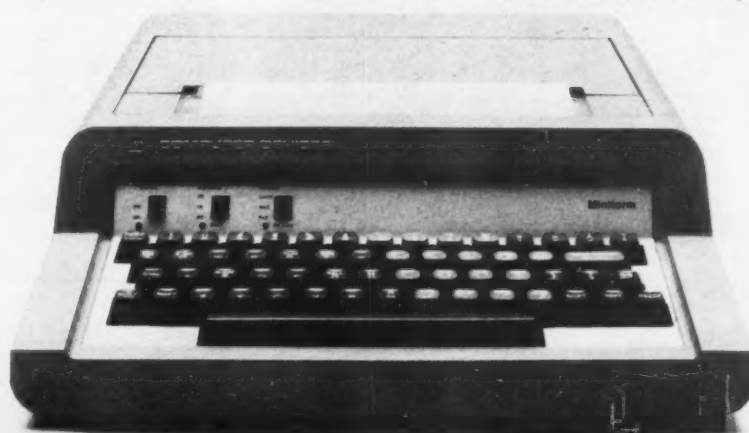
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## Changes Needed In Management

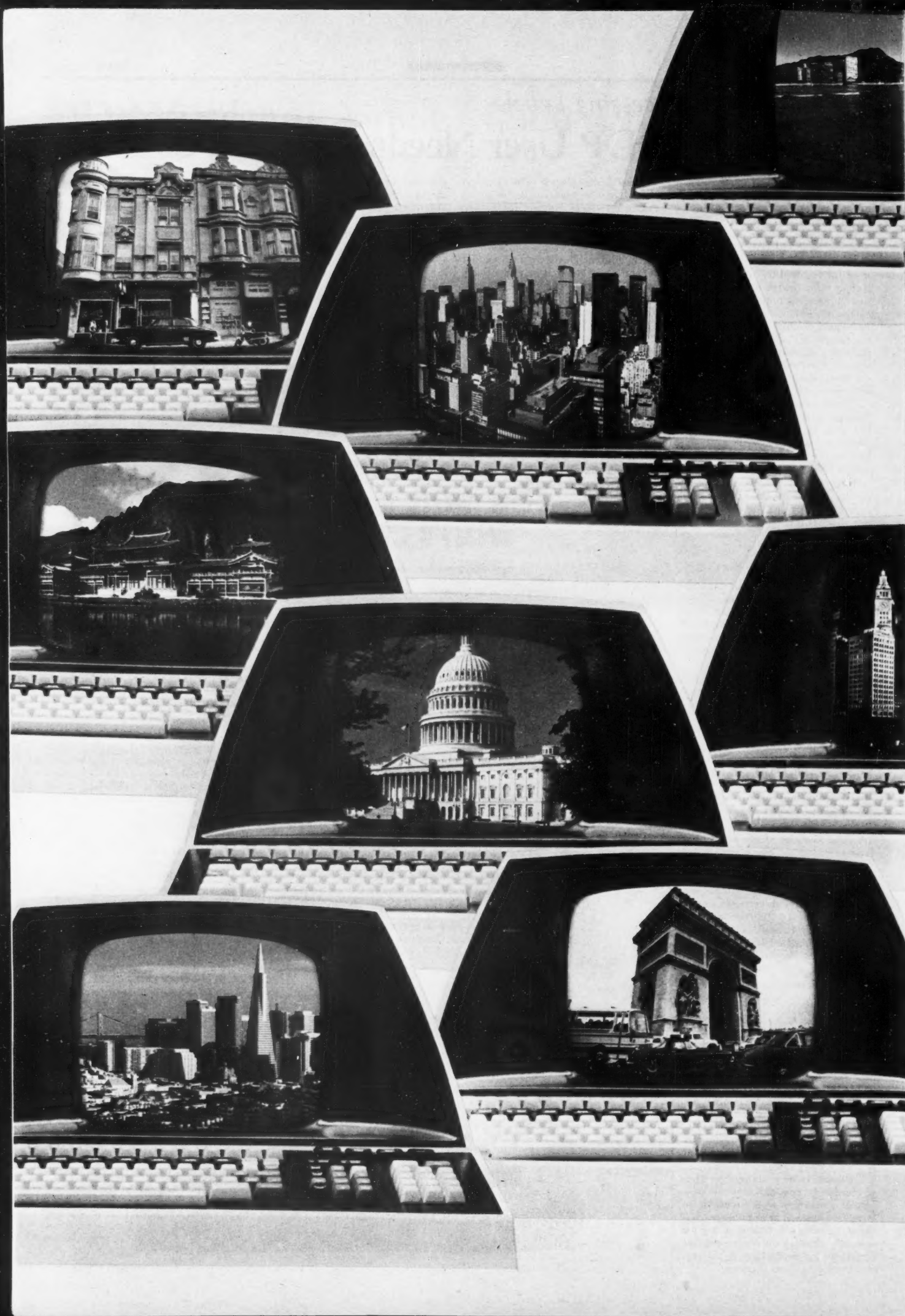
(Continued from Page SR/4)

will fail.

If failures of distributed processing are considered only with respect to hardware shortcomings and no attempt is made to study the human dimension, then distributed processing as a technology and a systems solution will eventually be nothing more than an obsolete buzzword.

Dalal is manager of management information systems at Brookhaven National Laboratory in Upton, N.Y. He is currently directing the implementation of distributed processing in the Administrative Systems Division.





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# Choice Involves Many Factors

## IBM 8100 and 4300 Aimed at Different Users

By Theresa T. Tanton  
Special to CW

In October 1978 IBM announced the 8100 information system, designed specifically for distributed processing applications, and then in January it announced the 4300 series, a set of 370-compatible processors that offer a broad range of support for both distributed and stand-alone applications.

In some respects, it appeared that IBM was competing with itself by announcing two new distributed processing support systems effectively back to back. However, the two machines are addressed at different approaches toward distributed processing.

The 8100 information system offers a choice of two compatible processors, the 8130 and the 8140, and a choice of two operating systems, the Distributed Processing Program Executive (DPPX), and the Distributed Processing Control Executive (DPCX). Through the use of DPPX, the user can develop application systems utilizing special versions of Cobol, Fortran and Sort.

This operating system can function as a stand-alone system or integrated into a cooperative network of host and peer systems. Access to 370 interactive facilities is provided through DPPX-3270 data stream compatibility.

DPCX was designed to provide a high degree of multiprogramming and to operate in an environment of tight host control. The 370 is used for

DPCX application development through the use of DPCX/3790 program statements. This operating system was designed to provide a growth path for the 3790 user.

### System Capabilities

The 4300 series consists of two processors, the 4331 and the 4341, is 370 compatible and can operate as a stand-alone machine or as a distributed processing system. This machine is intended for users who require more distributed file space and more distributed development capability and who must maintain 370 compatibility.

While the maximum core allowed on the 8140 is 512K bytes, the 4331 handles a maximum of 1M bytes and the 4341 can be set up with a maximum of 4M bytes of processor storage. The 8100 series disk capacity is 320M bytes while the 4300 series disk capacity is measured in billions of bytes.

The primary operating system for the 4300 series machines is DOS/VSE, a significant expansion of DOS/VS. Features of this operating system include support for the I/O devices announced for the 4300 series and significant improvement in performance through the use of the I/O address translation capability of the 4300 processors. The 4300 series can also be operated using either VM/370 or OS/VS1.

In addition to operating as a stand-alone machine, the 4300 can be set up

	8100	4300
FIRST CUSTOMER SHIP	8/79	3/79
"SECOND CUSTOMER SHIP"	1st Qtr/80	3rd Qtr/79
370 COMPATIBILITY	NO	YES
3790 COMPATIBILITY	YES	NO
MAXIMUM CORE CAPACITY	512K	4096K
DISK STORAGE CAPACITY	320MB	18 Billion Bytes
LANGUAGES	COBOL FORTRAN	COBOL, APL FORTRAN, PL/1 BASIC, RPG
DB/DC	DTMS	CICS, IMS DL/1
OPERATING SYSTEMS	DPPX DPCX	DOS/VSE VM/370 OS/VS1
COMMUNICATIONS	SNA CLUSTER	SNA HOST
LINK PROTOCOLS	SDLC BCS S/S	SDLC BCS S/S

IBM 4300 vs. 8100: Vital Statistics

for periodic data transfer or remote job entry to another 4300 or to a 370. In addition, through the use of CICS/VS with DL/1, and 4300 can provide support for applications accessed from either the host or node system.

Data most frequently used locally may be kept on the 4300's disk storage, with transaction access to the host data base as needed. Finally, the 4300 can act as a host to a series of 8100s and as a node to the 370, thus allowing for a complete distributed network capability.

### Final Determination

The determination of which of the two alternatives makes more sense to the potential distributed processing user involves many considerations. In either of the two cases, if the hardware is not already on order, or if the user can't buy an option from someone who does have the hardware on order, the earliest implementation of an operational distributed processing system would be in mid to late 1980.

In the case of the 8100, since its programming is not compatible with other machines, testing could not begin until the hardware is available (first quarter of 1980). For the 4300, much of the preliminary testing could be accomplished using the 370.

The impact of using the 4300 as a distributed machine is far greater on the organization than that of the 8100 from a staffing point of view. While the 8100 can be operated in a distributed environment without the need for trained operations personnel, the 4300 system will require at a minimum a trained computer operator and, in most cases, some programming support.

For users who are considering distributed implementation for the first time, this can be a significant difference.

The 8100 system can be used efficiently when most processing activity is supplied from the host 370, when

the volume of transactions and interactive communications is low and when the growth pattern for the organization is expected to be more sites as opposed to larger sites.

This system is intended for a smaller DP user than is the 4300 series. It should be used as a growth path for the 3790 user and for users who have low volumes of data access and storage requirements.

The 8100 is also a better choice when the user wants to keep DP control at the home office, since the system can be tested and maintained through a terminal hookup at the host site without a requirement for remote DP support.

The 4300 is a better choice when remote DP skills already exist, when the transaction volumes are high and when the growth is expected to be in terms of volume of work at the site as opposed to number of sites. This system will, however, cause a new set of management control problems for the user who has not previously had remote DP support.

Tanton is an associate of Dyer, Wells and Associates, Inc., an Atlanta firm that provides consulting services in DP, office automation and the integration of data and word processing.

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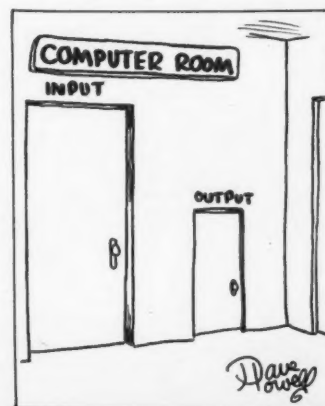
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# Distributed Minis Aiding Solar Energy Tests

Special to CW  
ALBUQUERQUE, N.M. — As part of the search for practical alternatives to fossil fuels for energy generation, a distributed processing network of minicomputers is supporting one of the world's largest solar energy test facilities.

Sandia Laboratories runs the Central Receiver Test Facility (CRTF) here for the U.S. Department of Energy to provide experimental data that will eventually be used to design solar thermal electric plants for large-scale power generation. The CRTF can receive up to five million watts of solar thermal power.

According to David Darsey, project leader at Sandia, "the key feature of the facility is its flexibility, since it must be capable of testing a variety of solar power conversion receivers and heliostat (mirror) fields, other energy conversion techniques such as photovoltaic cells and unique chemical and metallurgical processes."

At the heart of this flexibility, Darsey explained, is the master control system (MCS), using five Hewlett-Packard Co. HP 1000 minicomputers. The MCS is a real-time command, control and data system for control management and supervision as well as data collection, analysis and display. The MCS links all aspects of the test facility.

The CRTF, spread over 10 acres, is made up of a tower, heliostat fields and a control building. Resting on a 50-ft-deep concrete foundation, the steel and concrete experiment tower rises 200 ft above the desert floor.

The tower top and three test bays located at 120-, 140-, and 160-ft levels on the north face of the tower, are served by a 100-ton elevator. Located in the tower are instrumentation for testing, heat rejection equipment for cooling and condensing steam to feed water and a laser scanning device for aligning the heliostat mirrors.

The sun-tracking heliostats, which are used to collect and concentrate energy coming from the sun, are organized in arrays containing 25 4-ft-square glass mirrors that are focused and aligned to produce a single concentrated beam of solar radiation directed at any desired test receiver on the tower — for instance, a boiler for producing steam.

Each heliostat is individually controlled to produce the desired intensity of energy for the experiments. In all, there are 222 heliostat arrays totaling 88,880 sq ft of focusing surface.

The five HP 1000 minicomputers communicate both among themselves and with

Modular Computer Corp. minis that directly control the heliostats.

## Control System

The HP 1000 control computer, located in the control building, has 210K bytes of memory and is configured with an HP 7905 15M-byte disk drive. This system is the interface for the facility operator's CRT terminals, through which the entire

CRTF may be controlled.

The operator can selectively display control or experiment data in color on a graphics terminal. The control computer communicates with the data computer, also located in the control building, as well as with the four heliostat controllers.

The computer calculates the sun's position from time and ephemeris data once each second, making corrections for

atmospheric refraction, and transmits this data to each of the four heliostat controllers along with positioning commands.

A 284K-byte data computer is configured with two HP 7905 15M-byte disks for use as the primary experimenter's interface to the control system, handling all experiment control activities. This system also controls and acquires data from the heat rejection sys-

tem, four meteorological stations and the data acquisition system (DAS) mini.

Selected data stored by programs running in the foreground can be analyzed in the background and then transmitted to the control computer for display.

## Data Acquisition

The 64K-byte DAS is operated as a satellite of the data (Continued on Page SR/28)

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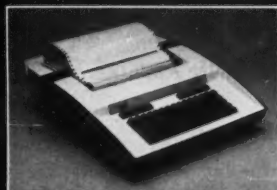
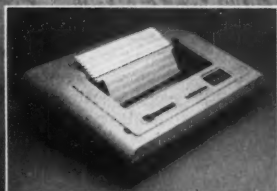
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## With Emphasis on Local Mode Net Boosts Western Electric's Order Control

By William G. Pulley  
And David N. Wilson  
Special to CW

Since its inauguration, Western Electric Co.'s material management concept, a system through which all products are shipped to strategically located warehouses called material management centers (MMC), has provided an efficient and economical way to distribute products to customers.

System benefits have included inventory reductions — which pared warehousing costs — and a greater degree

*This article, adapted by permission from The Western Electric Engineer, describes how a data collection network at Bell's Western Electric Co. updates two data bases to monitor the status of orders and ensure their timely delivery. Since the network's implementation, both system and terminal availability have reportedly averaged nearly 100%.*

of responsiveness to customers' demands.

We originally intended the use of data collection with a locally distributed data base to provide a backup procedure for the order control function. This function was expected to normally execute in the background teleprocessing system.

However, the local mode has become the primary mode of operation — a situation that has provided more effective use of the fixed-cost minicomputer network. It has also allowed us to reduce communications line requirements from two 9,600 bit/sec lines to two 4,800 bit/sec lines, substantially reducing our teleprocessing overhead.

From a total of 60 transaction codes that constitute the entire on-line application system, 20 are supported by minicomputers. This represents an average of 3,300 local transactions daily.

Further, about 2,200 source data collection transactions are handled each day by the local system and about 2,000 transactions are entered daily in the remote mode.

Operational availability of terminals has been averaging more than 98.9% and system availability has been virtually 100%. The configuration ensures that operable terminals are within close proximity in the event local line or hardware failures bring some terminals down.

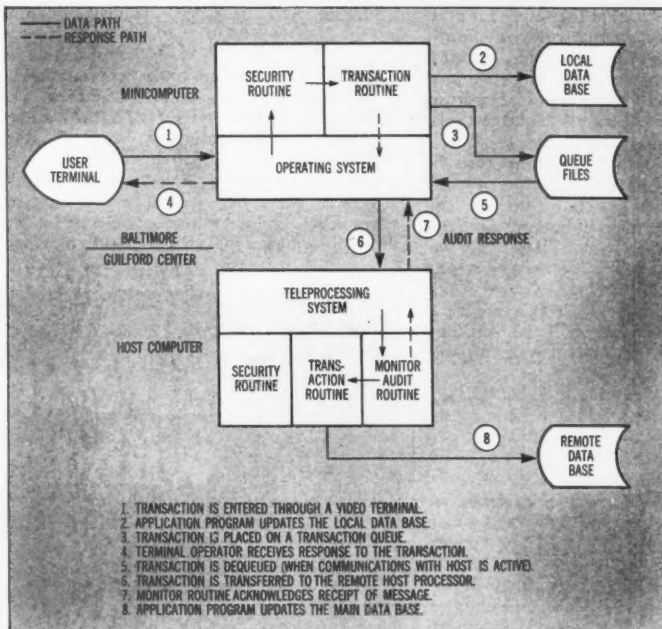
Only a widespread electrical power failure of both of the system's two minis would cause the entire system to be inaccessible. This high level of reliability has ensured a continuous flow of finished product and a quick turnaround of commercial trucks at the shipping docks. It has also eliminated the need for a buffer inventory of finished goods.

### Certain Disruptions

At many manufacturing locations, the implementation of the material management system caused disruptions in the way of doing business. All manufacturing locations had some type of computer-controlled merchandise system that performed functions such as placing stock-replenishment orders on manufacturing facilities, selecting completed stock to fill customers' orders and maintaining perpetual in-house inventories.

With the advent of the MMC concept, the scope of these functions changed so that many systems became obsolete and had to be refurbished.

The changes introduced by the concept affected the timing of existing systems. Those systems designed around monthly merchandising requirements proved too sluggish to re-



Diagrams Copyright 1979, Western Electric Engineer

Figure 1. Distributed data base processing in the local mode. New data immediately updates local files and triggers the sequence of events above to ensure the timely updating of remote files.

spond to the MMC-imposed need for weekly service performance.

Moreover, finished products could be shipped only to satisfy existing orders. This meant that a weekly overshipment to one MMC could not be made in anticipation of next week's load, nor would it compensate for a weekly undershipment to another MMC. The need for accurate, timely merchandising systems heightened.

Manufacturing personnel at Western Electric's Baltimore Works had to know the current status of orders at any time. Batch-generated status reports would have been outdated by the

time they arrived at the many widely dispersed packing locations.

A new on-line order control system seemed the best alternative available.

### Data Communications

The system's hardware includes 12 terminal controllers that provide communications between local minicomputers and 67 modular intelligent terminals; 28 80-char. line printers; and two dual-terminating minicomputers, each with 128K bytes of memory, linked via independent lines to a host IBM 370/158 located at the firm's

(Continued on Page SR/30)



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Lots of manufacturers offer vanilla terminals that meet their specifications. And, in lots of applications, that may be all you need. But, if you're a design engineer with a tailored system in mind, why sacrifice it to comply with your CRT's limitations? You do have an alternative. Ann Arbor sells user-definable terminals.

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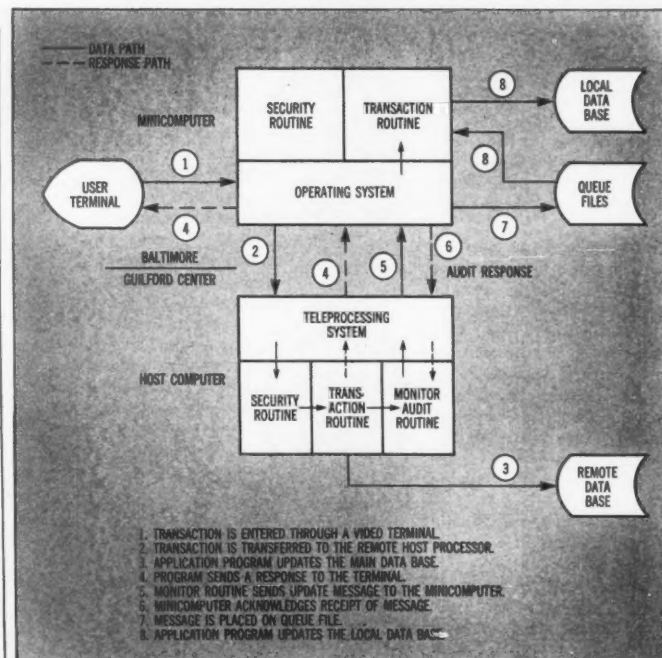
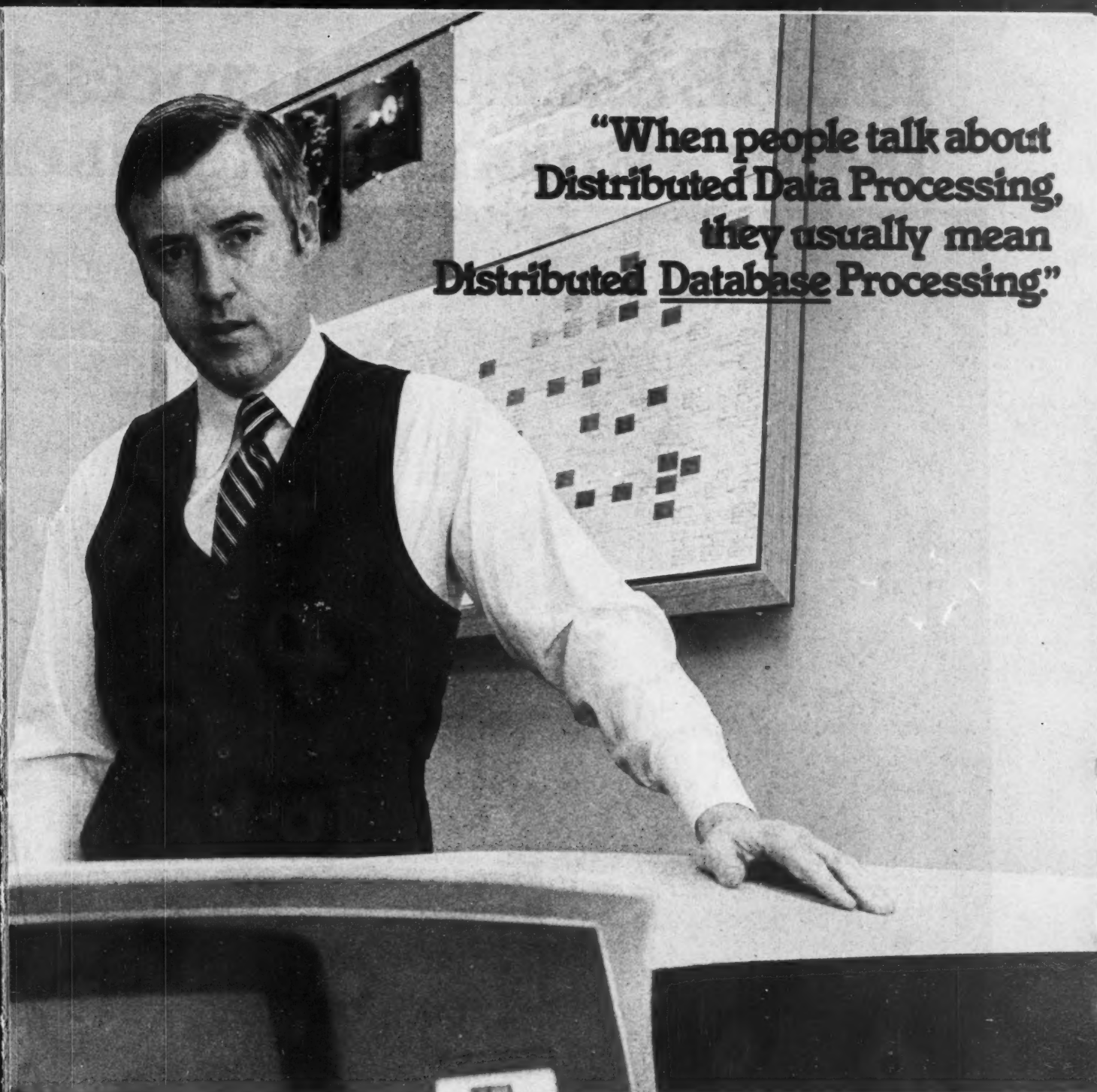


Figure 2. Distributed data base processing in the remote mode. Though not the normal mode of operation, should data be entered from a terminal in the remote mode, the steps above automatically update local files.



**"When people talk about  
Distributed Data Processing,  
they usually mean  
Distributed Database Processing."**

What's attractive about distributed database is that it makes data available at the local level where it is needed but still allows control of the data from a central site.

With the availability of low-cost, high-performance hardware like the IBM 4300, more and more organizations are including distributed database networks in their future plans.

That future is here *today* with Cullinane Corporation. Cullinane pioneered in distributed database technology when we designed and implemented a prototype back-end database system for four government agencies. What we learned from this project about the unique requirements of distributed database technology led directly to the architecture of Release 5.0 of IDMS, IDMS-DC, our new powerful teleprocessing monitor, and Multiple

Computer Support (MCS), a system that allows multiple IBM-compatible CPUs to share databases.

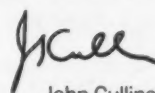
These three products—IDMS 5.0, IDMS-DC and MCS—allow applications programs to reside at remote sites and to update a central control database with user transparency and database integrity. Distributed database systems allow upper management to consolidate information from remote databases into a central database. This is possible through the separation of the application program from the DBMS—a capability which is unique to IDMS and essential to the implementation of distributed database systems.

Distributed database is only one example of Cullinane leadership in the development of management software designed to protect today's investment while providing

tools for the future. For example, we will be offering an interface which will allow IDMS to support DL/I applications. Another new product, the Automatic Applications Development System (AADS), will enable users to develop applications rapidly by defining a few simple parameters as opposed to performing complex coding tasks.

Before you make a database decision affecting your ability to manage your organization tomorrow, look at Cullinane today.

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John Cullinane, President

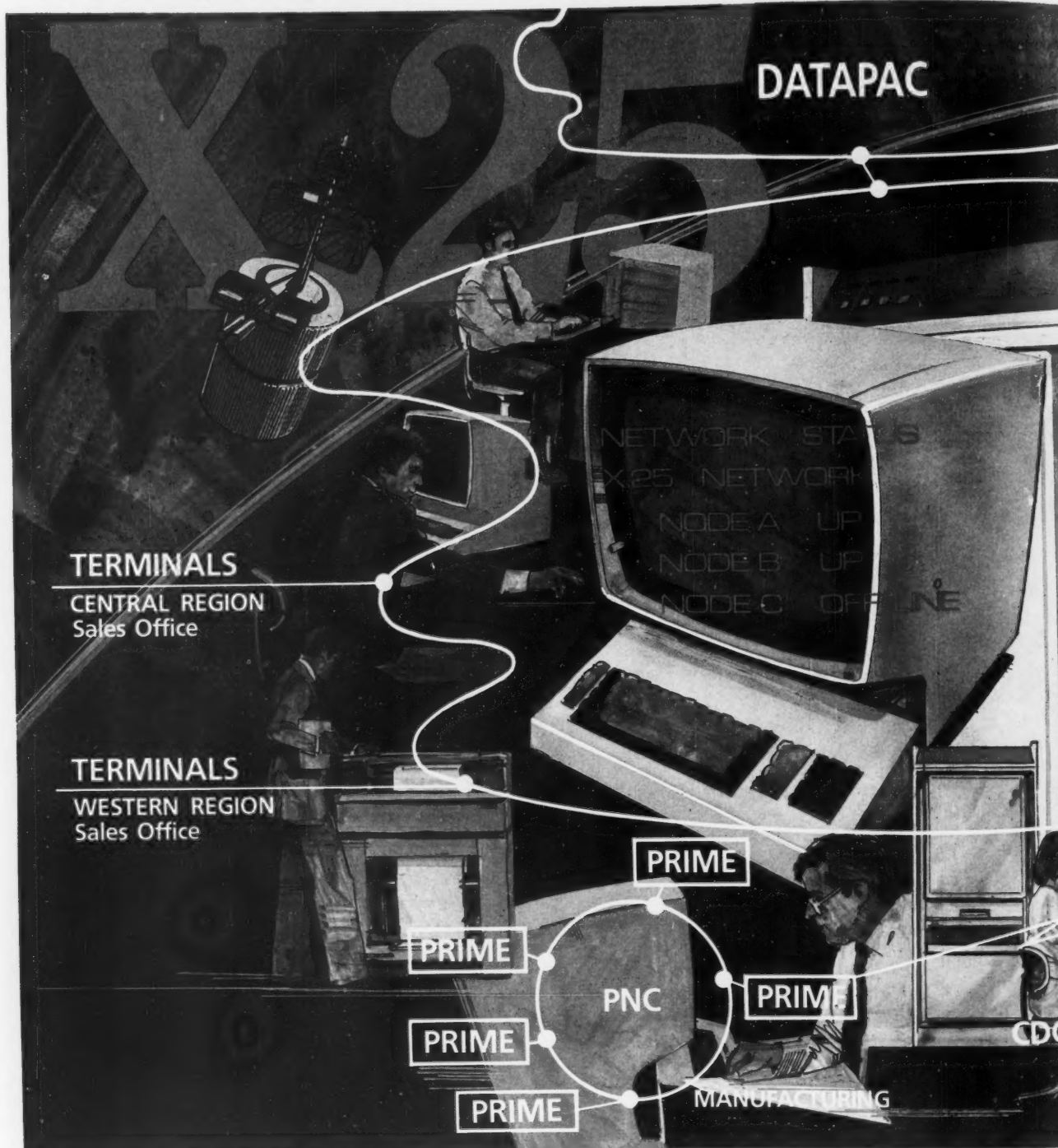
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If you're interested in promising concepts in distributed processing, you can talk to just about any computer company. But if you want workable solutions, you need more than promises. At Prime, distributed processing isn't just a concept; it's hardware and software products that work today, and work together.

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Every Prime computer—from the powerful Prime 750 to the Prime 450—uses the same software and has the same architecture. You can select a Prime computer with

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PRIMENET allows easy worldwide communication among Prime systems and terminals using both private facilities and

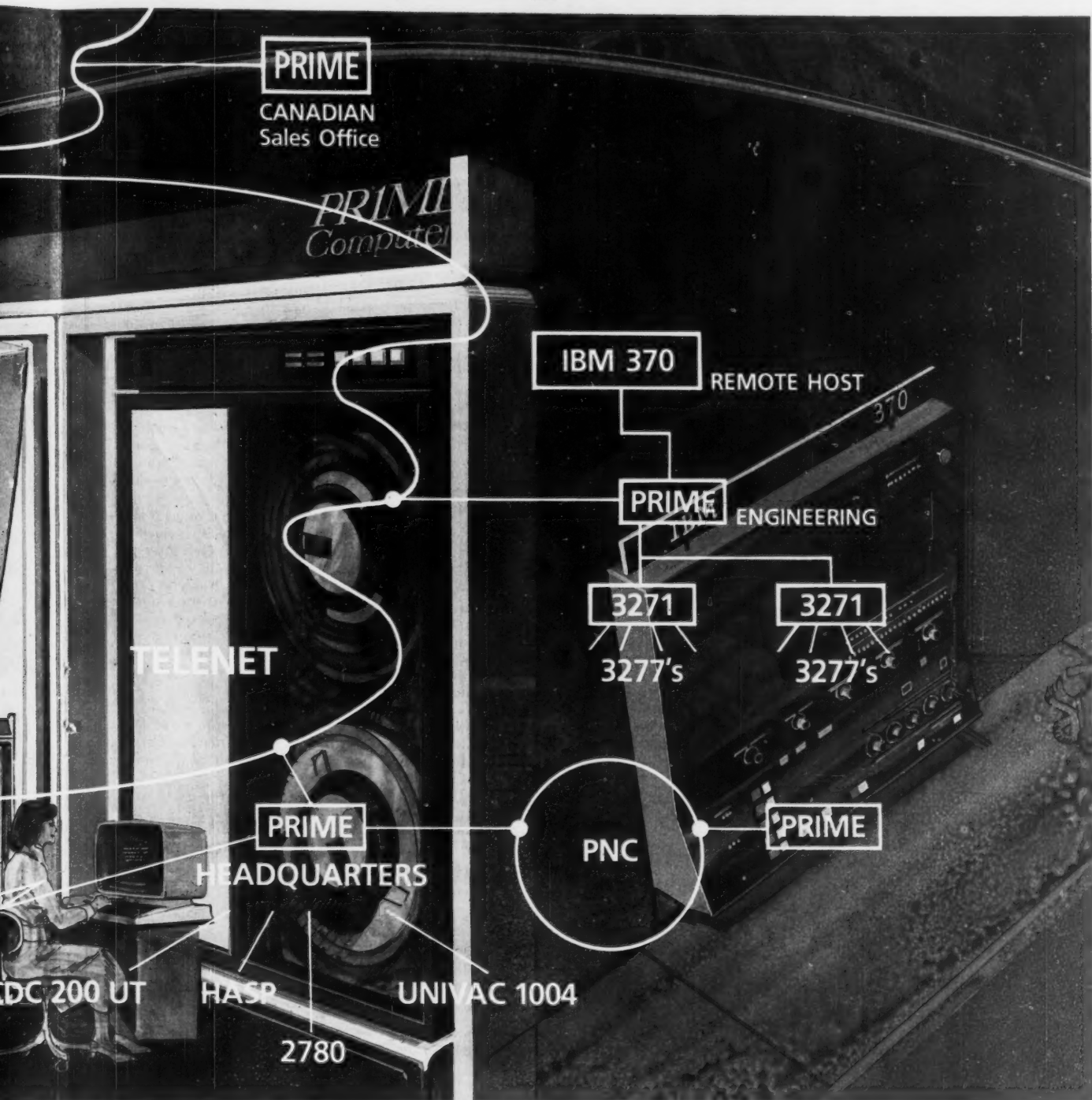
packet switching networks. PRIMENET complies with the CCITT X.25 standard and permits direct connections to domestic and international packet switching networks. This lets you drastically reduce the cost of long distance data communication.

You choose the communication method you need, without being locked into a unique vendor's architecture.

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Prime's Distributed Processing Terminal Executive, DPTX, provides a smooth, low-risk transition into distributed processing in IBM 3270 environments. DPTX protects your investment in IBM hardware and software. With DPTX, you can continue to use your 3270 terminal systems

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interact with applications in both the Prime and IBM mainframe environments.

You choose which applications to move, without worrying about moving them all at once.

#### Hardware connections simplified.

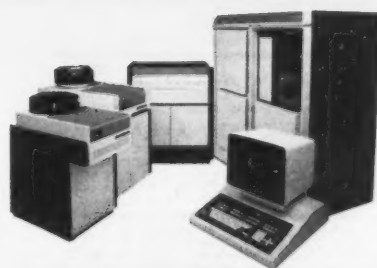
Prime offers a selection of high-performance, high-reliability communication controllers. Among them, the Multiple Data Link Controller concurrently supports PRIMENET, DPTX, IBM HASP and 2780, Univac 1004, and CDC 200UT. And the PRIMENET Node Controller, PNC, connects multiple Prime systems in high-speed local ring networks.

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Perhaps the most impressive feature of Prime's distributed processing products is that you can see them in action today. In fact, our own internal distributed processing network links Prime manufacturing, marketing, development, and administrative organizations, locally and across the United States. The products used are not special versions, but the same ones we offer customers. If you'd like to see a demonstration of this network, contact Patrick J. Sansonetti, (617) 237-6990, Prime Computer, Inc., 40 Walnut Street, Wellesley Hills, Mass. 02181.



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# Obstacles Persist in Designing DDP Systems

(Continued from Page SR/2)  
 distinct since so little of the required distributed functionality exists as standard offerings.

## Two Extremes

Two extremes exist relative to the distribution of the three basic functions. In the first, all three functions are configured at a single, centrally located site. This represents the classical, totally centralized network.

In the second, each of the three functions is configured at multiple, geographically separate sites that are interconnected. This is the newer, totally distributed information network.

Obviously, intermediate levels of functional distribution exist. Centralized information processing and data base processing with distributed network processing represent one form of partially distributed functionality. Centralized data base processing with

distributed information processing and network processing represent another.

At the lower functional levels, numerous other partial distributions are possible.

The stated objectives for the various forms of distributed functionality are many. Increased levels of throughput and overall performance through the uniform distribution of the processing load over the currently available resources is a frequent goal, and higher levels of availability/reliability with multiple processing resources are another.

Decreased response times as a result of shorter terminal-to-processor paths (fewer links and relay nodes to traverse) are still another.

## Alternate Approach

Visible and growing numbers of larger-scale users, facing the complexity of scale in further attempts at centralization and lacking the resources, time and funds to pioneer the distributed functionality, are considering an alternate approach: the installation of multiple, independent, autonomous minicomputers in whatever number is required to meet the user community needs.

The increasingly attractive price/performance characteristics of the current generation of minicomputers makes this an approach worth investigating.

While the multiple minicomputer approach minimizes or possibly eliminates many of the yet unsolved problems of the large, totally distributed, interconnected networks, a note of caution is in order. Unless the approach is properly organized and administered, many of the problems of the past that the large centrally located

installations solved will reappear.

Differences in report forms, data base architectures, programming and documentation standards, terminal interface and data communications procedures will rapidly proliferate. Difficulties in the flow of information from the lower level operational applications up through the control and strategic planning levels will also appear.

If the objective of the computer industry is to fit functional, cost-justifiable solutions to the user community problems, all three currently visible approaches — totally centralized, partially/totally interconnected distributed, multiple independent minicomputers — have their places.

Higher level, semi-automated analysis and design techniques are emerging that will permit the fairly rapid evaluation of the user requirement and derivation of an appropriate solution(s). These techniques will assume major significance in the vendor evaluation and selection process because of the increasing complexity of efforts to benchmark networks of even modest proportions.

The newer analysis and design procedures will also assist in identifying the information sources, interrelationships and structures that exist in the user organization the network will serve. The resulting optimization of the selected configuration will be most appreciated by the growing class of users that recognize information as their most valuable resource and are taking steps to manage it as such.

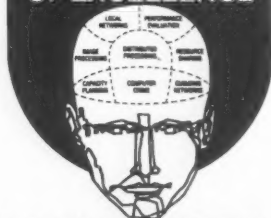
Becker is manager of communications and distributed systems at Advanced Computer Techniques Corp., Suite 101, 222 N. Central, Phoenix, Ariz. 85004.

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## Time-Sharing Important In Viewing Growth of DDP

(Continued from Page SR/5)

able to meet those needs.

In organizations where management responsibility is highly centralized, for example, it may be most appropriate for information distribution to be centralized. Where an organization depends on independent decision making in local settings, information should be available locally.

In terms of function, however, the physical location of the processing hardware is far less important than the user's perception of the processing activity. At DTSS, Inc., we like to talk about the integration of information processing, as well as its distribution. We see the centralized processing role as remaining important, while becoming less dominant and serving those needs that a central mainframe can best serve.

We see local computing taking on an ever larger role as the technology becomes cheaper and the demand for this capability grows greater. Time-sharing can play a vital role in the interplay between local computer power and centralized capabilities, providing the choice to go interactive with the mainframe or to work with local data, depending on the goals and the economics of the user's situation.

In our view, the momentum which is

now building toward establishing a multiplicity of networks will be crucial in the future evolution of distributed systems. As connect charges decrease, accessibility increases and reliability becomes more consistent, the concepts of "remote" and "local" will become less relevant.

As these developments continue to occur, time-sharing will become important in situations where large data bases must be shared, the user community is geographically dispersed and users require a wide variety of applications programs. With the right kind of system, the virtues of both centralized and distributed processing can be enjoyed.

The 1980s will see the computer become a more familiar part of our society, with a probable shift toward decentralized, interactive computing and away from centralized DP. Sharing time on large mainframes will still be a valuable activity in a decentralized environment, however, and we can expect to see the use of time-sharing continue to grow along with distributed processing in the next decade.

Hargraves is president of DTSS, Inc. in Hanover, N.H. Now a subsidiary of Metropolitan Life Insurance Co., DTSS was founded by Dartmouth College in 1972.

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# DDP Offers Challenge to Managerial Expertise

By Leonard R. Rittner

Special to CW

Distributed data processing's (DDP) greatest challenge is to managerial rather than technical expertise. The user must identify corporate objectives and apply administrative savvy to meet those objectives.

This entails "hard-nosed" business decisions regarding sales, profits and return on investment. The implementation of distributed processing systems should be treated primarily as a reorganization of plans and objectives to boost performance at the divisional or local level. The technical redistribution of the data base has secondary importance.

As we move away from the technical points of dispersing a data base and

view it from the managerial standpoint, it appears that a careful balance must be maintained between economy of operation and the level of service to the user.

## Classic Approach

The classic approach is to standardize at each location. The theory is that if all the files, products, input, hardware, peripherals, application programs, systems and software packages are the same, it will be an easy matter to standardize. But in the real world, this is rarely the case.

"Cloning" the system and placing it in various geographic areas around the country or the world has a certain appeal, but it is a simplistic solution. Product lines, files, I/O, computers

and software are not the same; forcing a standardization that is not appropriate given the sales volumes, geographic area and available manpower resources may not be the answer.

Similarity in applications does not necessarily entail similarity in implementation, systems and programming. The designer of a distributed processing network must strive to impose standardization while serving the marketing emphases, sales volumes and strategies peculiar to each site.

## Minimizing Costs

The purpose of standardization is to minimize the cost of decentralization and avoid duplication of costs.

However, most DP costs have nothing to do with economies of scale or

geographic distribution. While the cost of living does vary from city to city, data entry and scheduling activities, control and computer operations usually cost about the same regardless of location.

It has been clearly demonstrated that large computers represent less and less of a cost advantage as the price of hardware continues to drop dramatically.

Where, then, are the alleged savings of cloning an operation, dropping the duplicate set-up throughout the country or the world?

Such savings may be available in the programming and systems areas. Normally, two types of activities are handled there.

The first is research and development entailing original programming applications. Here, the user organization can often save time by developing the same application in several locations simultaneously. But this redundancy obviously creates heavy costs and can tie up too many technical people at a time when they are in short supply.

The other kind of software activity is maintenance programming. Even in a completely standardized shop, maintenance has to be done at each geographic location because of varying business conditions.

So-called standard programs must, therefore, be customized to meet local constraints. This is the experience of any decentralized DP operation that has accepted standard programs from corporate management and tried to implement them.

## Assigning Rights, Funds

Development funds and proprietary rights should be assigned to each geographic area. This prompts each area to develop specific applications in a noncompetitive manner. Corporate management can also appropriate funds to encourage each development site to endow its software products with "portability" features that make them usable elsewhere.

The use of "portable" systems developed by other divisions is mainly a question of profit maximization for the divisional manager, who uses the most effective DP resources available to meet his profit and sales responsibilities. If he has access to a "free" portable application program produced by another division, he obviously has incentive to use it.

But if the manager lacks access to appropriate software from other units of the company, he might be able to increase profits by going his own way. In this situation, the manager should decide for himself whether standardization is an important goal.

In summary, cloning a DP facility and placing this standardized unit at various locations around the country has limited cost advantages and serious inherent structural limitations. Real cost savings can usually be found in the applications development area and through subsidies from the corporate level that encourage local sites to make their systems usable throughout the organization.

Rittner is a vice-president of the Combined Insurance Co. of America, 111 Washington St., Brookline, Mass. 02146.

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So there were tested software applications available to us. Plus the right size computer for each of our locations. And concurrent multi-function options, like forms entry and integrated word processing.

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Maybe most important, Basic Four doesn't just dump equipment on the doorstep and walk away. They stay with you—installing, training, debugging, even hand-holding. As long as you need them.

Distributed processing has to fit the job. And the best fit for our job was Basic Four.

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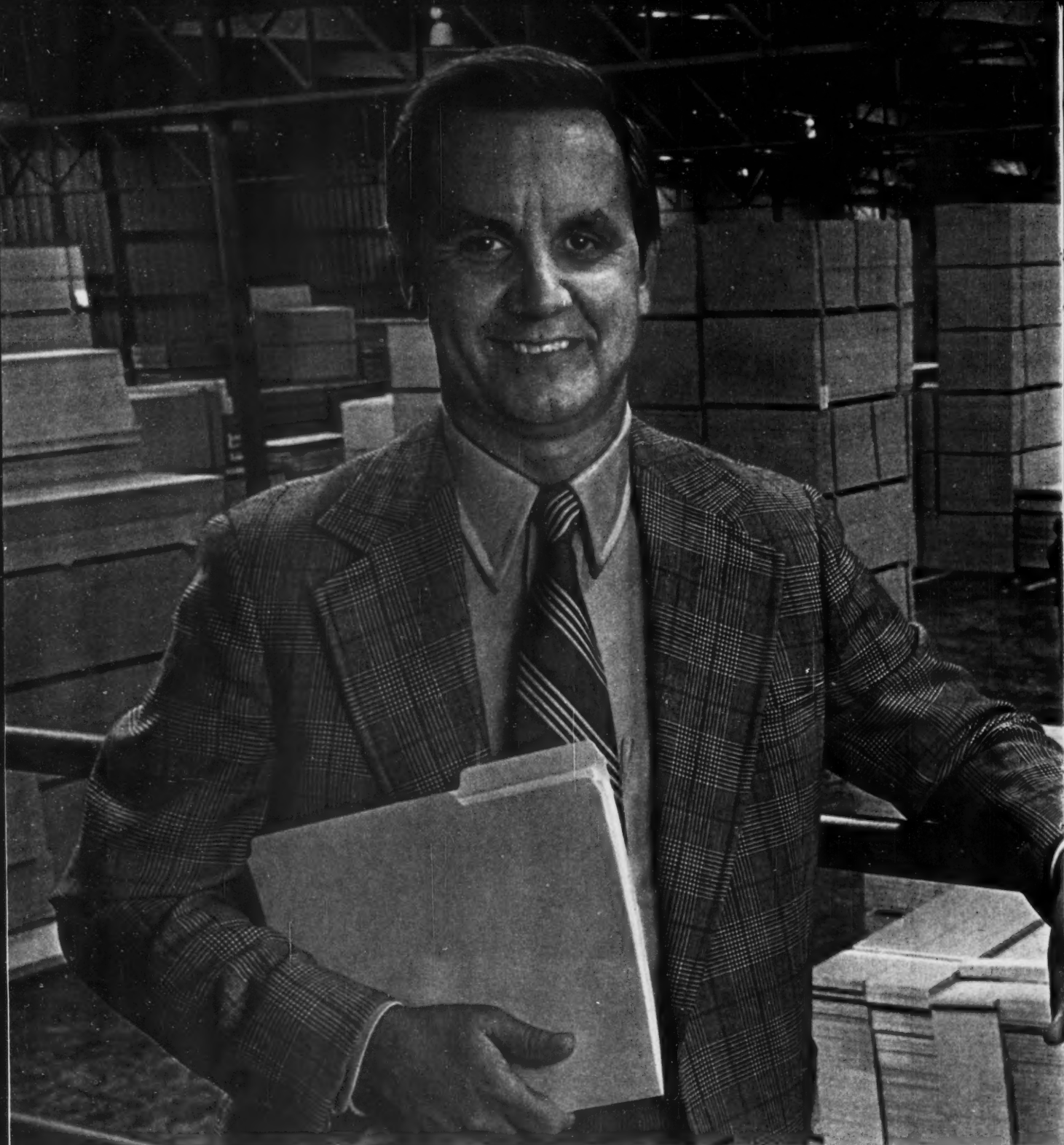
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"Thirty-three Champion distribution centers now have their own Series/1 for such functions as order entry, invoicing and inventory con-

trol," he continues. "At night, each Series/1 transmits consolidated data to our large IBM computers for timely management use. And they're helping us plug profit leaks through better control of inventories and complicated pricing schedules.

"All in all, our Series/1 units start to pay for themselves from the day they go on line. By 1980, we expect to equip over 150 field locations with them."

To achieve full distributed processing capability at so many remote locations and integrate those stations with the central computer, Champion developed its own versatile data management system, including a unique programming language.

The IBM Series/1 is small enough to fit almost anywhere, flexible enough to manage a variety of data processing tasks and powerful enough to handle both remote termi-

# "We deliver computing power to 33 of our field locations through distributed processing with the IBM Series/1."

*Paul Pavloff, Vice President, Management Information Systems, Champion International Corporation*

nal and central information processing. It features online capability so that information is available to you at any terminal just as quickly as it's processed. And because it's modular, Series/1 is ready to grow when you are.

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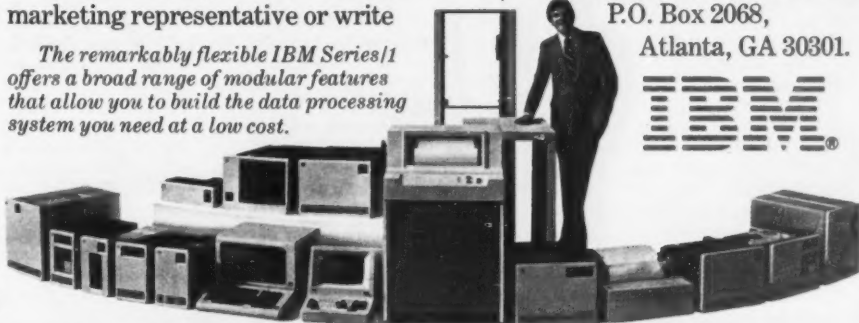
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# DDP Adaptable to Airline Upkeep Operations

(Continued from Page SR/6)

- Development of training programs for local users.

Characteristics of the second function include:

- Development of local application systems or programs in cooperation with central DP personnel.
- Documentation and control over local application systems and programs.
- Local data base management and control.
- Development of a control system for data base exchange within the maintenance and engineering division using local data base dictionary definitions.
- Standardization of distributed processing procedures.
- Coordination between application areas within the maintenance and engineering divisions.

An application of distributed processing that harmonizes with the central site's processing structure generally provides great benefits to both central and local users. Exchange of the central and local data bases may provide more accurate data to the central facility and increase its volume of activity.

The propagation of DP technology to the local users via distributed processing applications may upgrade the work skills of non-DP personnel and curtail any shortage of DP professionals in the long run.

Lee is a programmer and reliability statistics analyst for American Airlines, Inc. who lives in Broken Arrow, Okla.

## DDP Entering New Generation

(Continued from Page SR/2)

should expect the language to come equipped with a rich set of display-oriented interactive programming aids including editors, trace and debug utilities and configurators.

- The system should have enhanced communications capabilities. The terminal should be able to communicate in a batch and interactive mode at the same time, and it should also be possible to read and write to the host, treating it like a peripheral device.

The read/write capability should be provided by the special distributed processing language discussed earlier, and an unskilled operator should be able to use programs without knowing or caring whether host or local processing is occurring at any given instant.

- The system should have flexible data base management capabilities. Multikeyed access goes hand-in-hand with distributed data base applications. This contrasts with the more structured central DP environment in which files are usually accessible by one or two keys.

In the standard environment, programmers can write a program or set up a utility if they need to retrieve their information in a different way. But in a non-DP environment, this is not possible, and the data base management system must be designed with this fact in mind.

Allowing as many as 10 keys for accessing information is not unreasonable for a distributed system. The data base support must be carefully designed to allow for this flexibility.

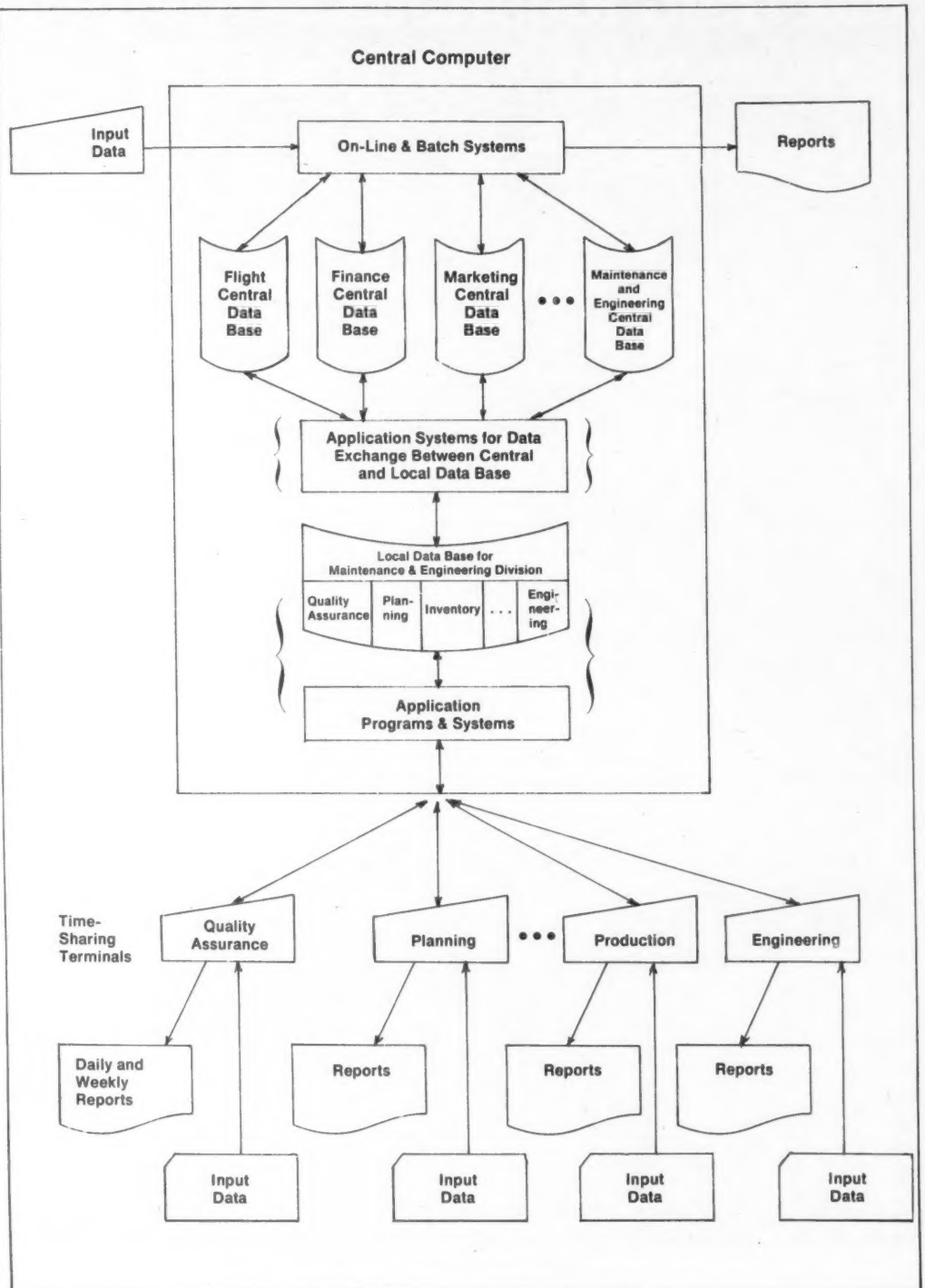


Figure 3. DDP System Using Local Computer

able for a distributed system. The data base support must be carefully designed to allow for this flexibility.

- The system should have powerful network support aids. Typically, the DP department has the responsibility for developing a distributed processing system which can be delivered to as few as five or as many as 50 users in the form of a turnkey system. Usually the development team cannot possibly provide on-site support for the resulting nationwide network because of the number of systems and their geographical dispersion.

A new type of support aid, never before needed, is now required in the form of remote access versions of program development aids including remote debugging, downline program loading and similar capabilities. Home office development systems should also be able to access remote systems for testing and modification.

• The system should have the capacity to add new applications and devices. We have only begun to see the demand generated by the first generation of distributed processing, so any system created today should be designed on the assumption that demand will continue to grow in the future — remember the office copier!

### Fast Acceptance

Experience shows that user acceptance of DDP has increased faster than anticipated. Five years ago, we felt that

six displays and one or two printers would be a typical complement of equipment for a branch office. But terminals and printers are now proliferating and becoming indispensable as usage soars. It is frequently necessary to support terminals downline from the distributed system in instances where an entire system cannot be justified.

These criteria can be used as an initial checklist for anyone implementing a DDP system. As we move into the second and third generation of the distributed approach to information management, we can be sure the list will grow.

Sharpe is marketing manager for manufacturing and distribution at Raytheon Data Systems, Co.

## Phasing Out Main DP Site Hyatt Hotels Moving to Decentralized DP

Special to CW

BURLINGAME, Calif. — A major hotel chain based here has reported substantial reductions in DP overhead and improved employee productivity since it established a distributed processing network.

Soon after the debut of Datapoint Corp.'s Datashare distributed system, the Hyatt Hotel Corp. installed one at the Hyatt Regency O'Hare in Chicago. Hyatt now supports its 51 hotels in 42 cities with 10 Datashares and also processes national sales and develops software on two Datapoint Attached Resource Computers (ARC) in Omaha and Rosemont, Calif., respectively.

The chain is in the process of installing two more ARCs for its hotel operations in the Los Angeles and San Francisco areas.

"As personnel in the field become more familiar with the systems and new application programs, the bulk of the processing activity is being moved into the field offices, according to Bob Regan, Hyatt's vice-president of management information systems.

"With this kind of shifting workload, we expect to be able to do away with the services of the mainframe in the DP center and put all the processing power right on the minicomputer in each hotel," he continued.

With Datapoint's Databus language, Hyatt's basic ARC configuration will consist of a single Model 6600 Advanced Processor; two Model 6000 attached processors; two 3800 attached processors — each with five mass storage disk units with a total of 100M bytes storage capacity; a 9-track tape drive; a 600 line/min printer; and eight or nine Model 3600 CRT workstations.

"Our plans for the future," Regan noted, "are that our hotels will not be sending any data at all to Burlingame. This, of course, will be a phased-in conversion to complete minicomputer-based Datashare and ARC systems. We have completed two applications already. Accounts receivable and general ledger are now totally in-house on the minicomputer.

"We're now rewriting accounts payable, which is scheduled for completion by mid-year, and the payroll system should be implemented by the last quarter of this year or first quarter of 1980. At that time we will completely shut down the mainframe-configured DP center in Burlingame," he said.

### No Cost Increase

"We have not had to increase the DP cost to our user hotels to do all of this.

However, we will save the corporation approximately \$540,000 annually when the DP center is phased out. This constitutes a legitimate saving on our part, and it is made possible by the dispersed processing approach," Regan added.

Although Hyatt has set itself up as a decentralized operation from hotel to hotel, development programs are highly centralized and are developed by the corporate DP staff at the Rosemont office.

"If something goes wrong with a standardized program, a member of our staff can get to the heart of the problem in a hurry," Regan claimed.

Since the bulk of Hyatt's business re-

volves around how many rooms it can sell, especially to business groups, much attention has been paid to putting together an effective national sales operation. The national sales application allows system operators to use workstations to access disk files containing detailed information on the availability of rooms and meeting facilities throughout the Hyatt chain.

Whenever a sale is made in this area, it is recorded on these centrally maintained files. This prevents overbookings and allows for more efficient handling of large blocks of sales.

"Ready access to up-to-the-minute computerized files has helped enormously in this facet of our business,"

Regan said. "Our sales people can now make arrangements for conventions and other large meetings with greater ease and confidence."

Hyatt, which began operations in 1957 with its first hotel at Los Angeles International Airport, now boasts more than 25,000 rooms in 22 states and the District of Columbia.

### Evolution Toward Distribution

The company made numerous changes to arrive at its present trend toward distributed systems from the time it established a DP operation at Hyatt's corporate offices here in Burlingame in 1971. The mainframe-

(Continued on Page SR/26)

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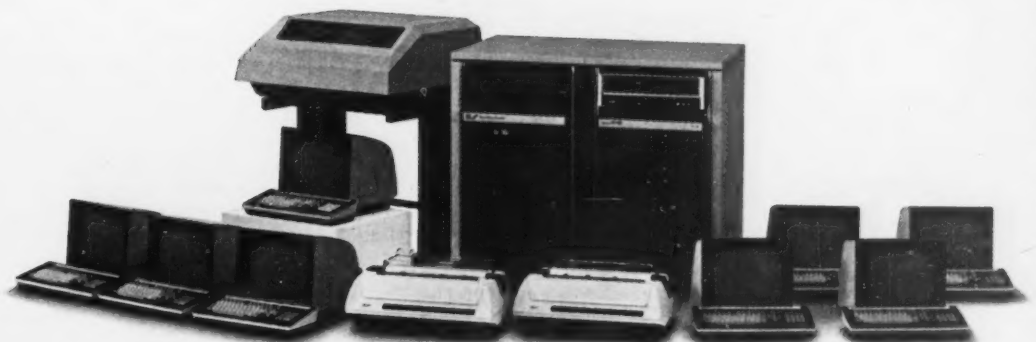
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# Independent Realtors Benefit From Network

By Jeffrey Bender

Special to CW

When you think about it, America's pioneers rolling across the continent in covered wagons really needed distributed processing. By transmitting data about terrain, roving bandits, weather and so forth, wagon trains in different areas could have built up a central data base and more intelligently planned their trips.

Some of today's small businessmen are like those pioneers. Their know-how and ambitions are great, but their resources are modest, and they are often overwhelmed by well-financed competitors.

Fiercely independent, they nevertheless need to band together in their own wagon trains to survive. And today, the link that joins their wagons is the computer.

A fine example is the real estate industry. Realtors can be divided into two groups — those that belong to a nationwide network (like Century 21 or Gallery of Homes) and those that do not.

Network realtors have all the advertising and, ergo, all the business. The small independent with five homes to sell doesn't stand a chance. However, several systems have been developed recently that help tie small realtors (with a computer) into one large super-independent.

PRC Realty Systems [CW, Feb. 5] and Recons Florida, Inc. [CW, May 7] are two on-line minicomputer systems for multiple listing service agencies.

Cost-effective for realtors employing at least eight salesmen, these systems, linked to individuals via remote terminals, help the realtor find houses described by the potential buyer with a fair amount of geographic independence.

Analysis of the client's income level and family needs can also be done to match the house to the buyer. Maintenance is done on-line, with each realtor adding, deleting or modifying house descriptions on the common file.

## For Smallest Realtors

For the smallest realtors, Computerhome has developed a similar system using microcomputers and a distributed data base. This system — complete with CRT, dual tape drives, computer and software — costs less than the terminal printer for a minicomputer, but restricts the realtor's flexibility considerably.

For instance, it operates in remote-batch mode and requires a manual central organization to periodically disseminate updated files to the network. In addition, it is tape-oriented and requires some handling by the realtor and cannot process nearly as much information as a minicomputer.

Still, because of its low cost and on-site location (allowing the realtor to use it for whatever he wants, whenever he wants), a microcomputer-based system will be the popular choice for many people.

Structurally, the Computerhome system is separated into three parts: file

creation, inquiry and maintenance.

After the system is first installed, the realtor uses the file creation program to construct his file. Sixty questions are asked for each house including price, county, city, rooms, bedrooms, bathrooms, fireplaces, cars in garage, floors, acres, building materials, house type, zoning, proximity, extras and a short description.

This information is blocked and written onto cassette tape. By using bit manipulation, complete house descriptions can be squeezed into 14 bytes, with an additional 14 bytes for the optional description. The realtor then sends his tape to a central facility where it is combined with other realtors' tapes and released to everyone in the network.

Additions, deletions or changes to the records are made at the realtor's convenience through the maintenance programs. These changes are in effect only on his tape until the central facility combines the tapes for redistribution.

When a potential home buyer visits

the real estate office, the realtor asks for his home requirements and keys this information into the inquiry program. Each home description that meets or exceeds these requirements is displayed on the CRT until either the end of the file or his interest is reached.

Half manual, half automatic systems such as a Computerhome network require a great deal of control by the users. Since microcomputers are incapable of extensive editing and validity checks, users quickly learn to stay within the rules or suffer with the garbage out.

As the user becomes more comfortable and experienced, new applications (perhaps in his own code) become realities. He starts to understand DP. Now, when the minicomputer salesman or network representative knocks on his door, the realtor can understand him and intelligently decide when and how to upgrade his business.

Bender is president of Computerhome, a developer of DP systems for the real estate industry, located in Shrub Oak, N.Y.

## Hyatt Hotels Taking Steps Toward Decentralized DP

(Continued from Page SR/23)

configured DP center used a batch mode system to serve its local hotels.

As the chain's operations expanded, keypunching and round-trip courier deliveries from user to mainframe to user became too time-consuming to produce meaningful reports, so it moved to terminal-type data capture for remote job entry. The keypunch equipment was replaced by a pair of Datapoint 2200 business processors with dual cassettes.

They were used for specialized accounting applications for the San Francisco area hotels, eliminating the need to send mail between those locations or pay for courier deliveries of paperwork. But by 1975, the centralized processing arrangement for the rest of the chain was running into computing difficulties.

"About this time, our data communications and processing problems were becoming too much to handle," Regan recalled. So when Datapoint announced Datashare, which promised the company time-sharing, mass storage disk drives, fast-print capabilities, remote terminal input and communications, Hyatt took a quick look and "we ordered it," Regan said.

The test site for the system was the Hyatt Regency O'Hare Hotel in Chicago. The company installed the system and wrote data entry programs under Datashare in which various functional areas of the accounting office — payroll, receivables, payables and general ledger — could each have a terminal for data entry.

At the end of the day, the accounting office would transmit the accumulated and preprocessed data via a dial-up line to Burlingame where processing would be completed, along with the data from the San Francisco area hotels. The processed data was then transmitted back to Chicago where the hotel could print its own hard-copy reports.

Today, Hyatt's dispersed DP network

includes the 10 Datashare systems across the country and the four ARC systems either installed or being installed.

Datapoint also supplies its Model 5500 business processors for the DP operation, providing 25M bytes of disk storage. Model 3600 CRT workstations are connected either by dial-up telephone lines or are hardwired to the 5500 processor servicing each area covered by an ARC system.

## Back-Office Accounting

Hyatt's back-office accounting program was basically designed for data entry and update of the four primary accounting applications and for password authorization needed to gain access into the network.

When accounting clerks at the workstations complete a data entry sequence, the data is transmitted to a 5500 for preprocessing and editing. This data is then transmitted to a 5500-based Datashare system in Burlingame via a dial-up line where it is placed on one of two mass storage disk systems and subsequently converted to tape media. The tape is then introduced into Hyatt's central mainframe, an NCR Corp. Century 201, which handles the final processing.

To get management reports, journals and other documents back into the hands of field personnel, the data flow is reversed, with tapes going back to disk and then back to the field 5500 unit which is used to generate printouts of these materials.

"Our investment in dispersed DP is already well on the way to paying for itself," Regan said. "We are well pleased with our systems here at Hyatt and I can't foresee any possible DP requirements we might encounter that couldn't be handled by the ARC."

"We think there are other hotel companies around that could also benefit from a system similar to the operation we have developed within Hyatt. It is certainly working well for us."

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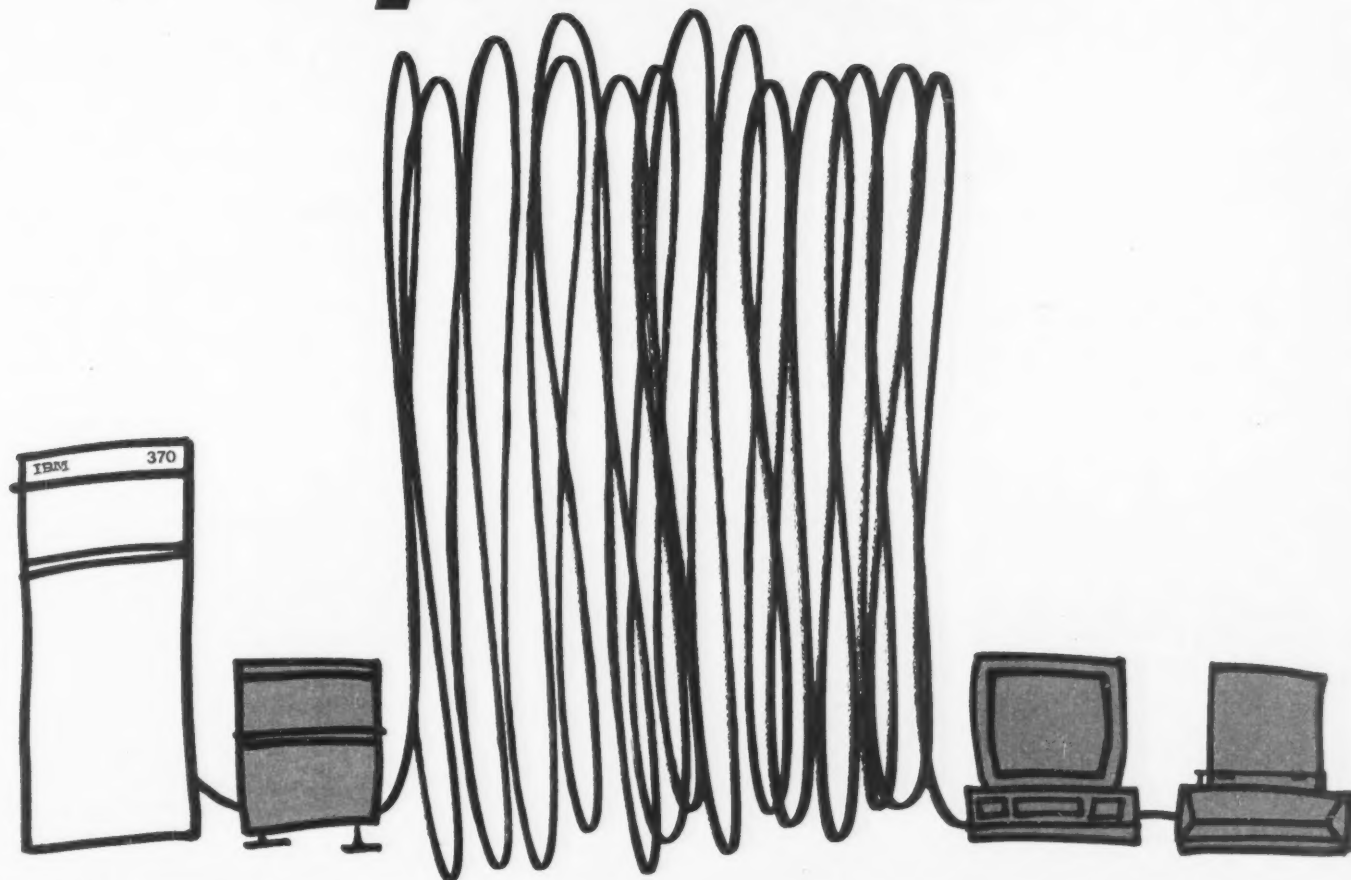
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# Industry Boasts Sophisticated Users

## DDP a 'Natural' for Publishing Applications

By David H. Goodstein  
Special to CW

Guess which \$53 billion-a-year industry is the most underrated applications area for distributed data processing (DDP)? Right. Printing and Publishing. Interestingly enough, it is also one of the most sophisticated users of distributed techniques for producing its product.

Newspapers (\$12.7 billion/year) and magazine publishers (\$3.4 billion/year) are the prime consumers of automated systems for information gathering, editing and correction, typesetting production, page makeup, product distribution and bookkeeping functions.

DDP is a natural for this industry whose very function is the collection, reformatting and distribution of information as a product.

Automation in this business began with the addition of computer intelligence to the photo-flash typesetters that appeared as commercially viable products in the late 1960s. These machines represented the first major advance for printing production in the prepress area since the invention of the Linotype machine in 1886.

### Mini Intelligence

Typesetters using photo techniques had been around for a few years, but the advent of minicomputer intelligence allowed it to be built in and made for more viable products. This was especially true once programs capable of performing hyphenation and justification functions were incorporated into "intelligent" typesetters such as the Photon 200, Mergenthaler Linotron 505 and the machines of the then fledgling Compugraphic Corp.

Production of finished high-quality type could be performed by having a typist enter text and commands on a paper tape perforator, then feeding the tape without additions into the typesetter, which then made all necessary typographic decisions.

Users of this technology almost immediately saw the desirability of having these capabilities spread around in their production environments. The intelligence in the typesetter, no matter how good, inherently meant a batch operation, serving only a single user at a time.

Within a few years, far-sighted newspaper publishers realized that the era of hot-metal typesetting was over. They commissioned systems to allow the elimination of their Linotypes. Price/performance constraints dictated the use of minicomputers with multiple paper-tape peripherals.

By 1970, several companies were offering CRT terminals for use in "perfecting" input to the typesetters. These were stand-alone units which read paper tape in, allowed operators to correct, add or delete text and commands displayed on the screen and then put out a new paper tape. It was only a short time before the CRT unit, or video display terminal, as this industry called it, moved from a stand-alone operation to its more rightful place as the primary device for input and editing in the typesetting environment.

Development of this technology was led by a handful of larger newspaper and magazine publishers in the U.S.

and Canada. Such were their needs that the number of terminals required to create a totally integrated system environment was quite high.

Minicomputers had allowed the distribution of intelligence in both editorial and production areas. However, systems with more than a moderate number of terminals being supported by a single minicomputer CPU, regardless of how well their designers claimed they would do, were in practice heavily burdened and in some cases unable to give acceptable response times.

Many of these systems were rescued by the arrival (none too soon) of 8-bit microcomputers. A new generation of

video editing terminals used them to integrate text entry and editing functions — and in some cases hyphenation and justification — into the terminal itself.

Control and interaction with the data base, on-line capture of information from wire services and direction of the flow of finished text to the phototypesetters remained the domain of the central minicomputer.

But the introduction of the 16-bit microprocessor gave the distribution of intelligence in the publishing environment another boost. Within short months after their announcement they had found a new home helping automate the production of display adver-

tisements in newspapers and the makeup of pages in magazines.

This was not a new application, since companies like Harris Corp. and Raytheon Data Systems Co. had been offering terminal-based ad composition systems since 1972. But a price drop from \$75,000 to \$30,000 per screen created a mass market; prior to the drop, composition and markup terminals had been relative luxuries.

Within the last year, microprocessors installed in the phototypesetters themselves have brought the purchase price of high-quality high-speed output devices from a 1976 low of \$100,000 to \$40,000. Lower price and more intelligence (Continued on Page SR/30)

### FEATURE COMPARISON CHART

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7 x 9 Dot Matrix	STD	STD	NO	NO	NO	NO	NO	NO
Background/Foreground	STD	STD	STD	NO	NO	NO	NO	STD
Insert/Delete Line	STD	STD	NO	NO	NO	NO	NO	STD
Insert/Delete Character	STD	NO	NO	NO	NO	NO	NO	NO
Clear End Line/Field/Page	STD	STD	NO	NO	STD	NO	NO	NO
Blink	STD	NO	STD	NO	NO	NO	NO	STD
Security Mode	STD	NO	STD	NO	NO	NO	NO	STD
Columnar and Field Tab	STD	NO	STD	NO	NO	NO	NO	STD
Line Drawing	STD	NO	NO	NO	STD	NO	NO	STD
Upper/Lower Case	STD	STD	STD	OPT	STD	NO	STD	STD
Numeric Pad	STD	STD	STD	OPT	STD	NO	NO	STD
Composite Video	STD	NO	NO	NO	NO	STD	NO	NO
Current Loop	STD	STD	NO	OPT	OPT	STD	STD	STD
Serial Copy Port	STD	STD	OPT	STD	OPT	NO	STD	STD
Hold Screen	STD	NO	NO	NO	STD	NO	NO	NO
Detachable Keyboard	STD	NO	NO	NO	NO	NO	NO	NO
Solid State Keyboard	STD	NO	NO	NO	NO	NO	STD	STD
Typematic Keys	STD	STD	STD	NO	NO	NO	STD	STD
Cursor Addressing	STD	STD	STD	STD	STD	STD	STD	STD
Read Cursor Address	STD	STD	STD	NO	NO	NO	NO	STD
Cursor Control Keys	STD	NO	STD	NO	STD	NO	NO	STD
Secondary Channel	STD	NO	NO	STD	NO	STD	NO	NO
Self Test	STD	NO	STD	NO	NO	NO	NO	STD
Baud Rate to 19,200	STD	STD	NO	STD	NO	NO	NO	NO
Smooth Scroll	STD	NO	NO	NO	NO	NO	NO	NO
Microprocessor	STD	STD	STD	NO	STD	NO	STD	STD
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# Net Hikes Western Electric's Order Control

(Continued from Page SR/12)  
Guilford Center.

The intelligent terminals are basically CRTs, with optional card scanners that function either as local data collection terminals or emulate remote IBM 3270s. Two 30M-byte disks provide storage for data files, security files, queue files and source data collection files.

Communications lines link the minis with each of four buildings in the Works complex. Two terminal controllers are connected to each line in the manufacturing buildings, while in the shipping warehouse one controller is attached to each line.

The design of the intelligent terminals allows a terminal operator to select either a local or remote mode of operation merely by pressing a switch key on the keyboard. In the local mode, terminals are controlled by application programs resident in the minicomputers.

These programs support such features as file updates, screen images, print formats, field composition, screen attributes and the operation of printers, on-line punches and card scanners.

## In Remote Mode

In the remote mode, where the mini emulates an IBM 3270, the terminals are controlled by application programs and message-formatting routines resident in the host computer at Guilford.

The minicomputers collect data and allow on-line printing of reports and

punching of cards. Data collection entails recording of shop data from wage incentive and production control activities. These data are entered by shop operators from any of 39 intelligent terminals with attached card scanners located at pay points, end-of-line operations and purchased material store-rooms.

After the operator has entered the data, the system validates the input, records it on a disk data collection file and returns a control number to the terminal screen to indicate a successful transaction.

Twice daily, data accumulated on the system disk data collection file is unloaded onto a magnetic tape, which is then transmitted to the remote host computer via a remote job entry terminal (an IBM 360/30) located in Baltimore. These records support several batch-oriented applications that execute on the host.

A second part of the source data collection provides the ability to print reports at any of three data control centers located in various buildings at the Works. This allows the timely distribution of wage incentive, accounting and production information.

The on-line card-punching subsystem, the third part of the data collection system, was designed to reproduce cards, with an intelligent terminal acting as an input device and one of three on-line punches serving as the output device. "Shop follow" cards are used as product delivery tickets for wage incentive reporting.

A two-step procedure was implemented for synchronizing the two data bases. First, on a weekly basis, the local files are completely refreshed with data extracted from the remote data base. Second, whenever a transaction affecting one data base is entered, a sequence of events begins to ensure that the other data base is also updated immediately.

The process for continuously synchronizing the two data bases is as follows: When update transactions are entered from the terminal in local mode, application programs within the minicomputers effect updates to the local files (See Figure 1). Concurrently, these transactions are also stored on a disk queue file.

The records on this file contain transaction codes, screen addresses and data. The format is identical to a message that might be sent from an information display system. If the teleprocessing system is active and is polling the minicomputer, the record is immediately dequeued and forwarded to the host computer.

In the event that communication between the host and the minis is lost, the dequeue process terminates and the local mode transactions proceed to update only the local data base and queuing files.

When communication with the host resumes, the records are dequeued sequentially so that the primary data is out of sequence with the local data only during the interim.

The system's teleprocessing software is a generalized commercial product that recognizes only communications line protocol. Consequently, the software in the host computer is unable to discern whether a terminal is operating in local or remote mode. And since the remote mode represents an emulation of a 3270, the software in the minicomputers merely forwards messages from the terminals in this mode, rather than intercept them (See Figure 2).

Although the transactions that update the order control data can be executed in either the local or remote mode, only the local mode is used. This provides the following advantages:

- Response time is faster because of the reduction of line traffic and the elimination of contention with other users.

- Users are not confused by the need to change modes of operation when host communication is lost.

- Routing all order control transactions through a single queue file protects the chronology of events since the transactions are sequence dependent.

- Editing all data locally gives the host a single, accurate set of data, reducing logging and eliminating validation errors.

But limiting the order control update transactions to the local mode does not prevent terminal operators from gaining access to the primary data base at the Guilford Center. Many inquiry and update transactions unrelated to order control can execute only in the remote mode, so terminal users can control their own mode of operation by a switch on the terminal.

Security programs resident in both the teleprocessing system and the minicomputers check all incoming transactions with the aid of the security files, and the programs validate the transactions entered. These validation procedures prevent terminal operators from attempting to enter order control update transactions while switched to the remote mode.

A monitor program in the teleprocessing system receives all messages from the minicomputer and routes them with sequence numbers to the appropriate application program.

Pulley and Wilson are senior members of the information systems staff in the Cable and Wire Division of Western Electric's Baltimore Works.

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## DDP Ideal for Publishers

(Continued from Page SR/29)  
gent operation are part of the reason for the 28% increase in installed typesetters worldwide expected in 1979 alone.

Every aspect of electronic publishing is now distributable and, in some cases, already distributed. Text capture and perfection are done on intelligent terminals and with portable terminals reporters can carry with them to the scene of the story. A new generation of optical character recognition equipment capable of reading more and different kinds of symbols (including previously typeset material) is opening the door for new opportunities in data base publishing and the creation of newspaper morgues.

### Word Processing

Distributed word processing is even allowing the publishing organization to capitalize on the keystrokes their clients capture. It is estimated that by 1980, 10% of all word processing units in the field will have the ability to interface directly to a phototypesetter. Even more will be able to transmit information to specialized systems which will reformat them for publication in some form or other.

Complex pagination functions are now being done on the composition and markup terminals. In a few years, these terminals will move into the offices of large advertisers (i.e., department stores or grocery chain headquarters) or ad agencies.

These terminals will also be used in regional offices of larger newspapers to help editors change page layouts for local editions electronically.

Output is the final link in the network of distributed functions. A new generation of intelligent copiers (such as Wang Laboratories, Inc.'s Image printer and the IBM 6670), ink jet printers and low-cost typesetters are making hard-copy output a more effective and accessible part of the composition process.

The final product of the process, the finished page, is also being distributed differently these days. Several organizations have successfully implemented a procedure to transmit digitized pages of their newspapers or magazines to multiple printing plants around the world.

Goodstein is an independent systems consultant based in Cambridge, Mass., who specializes in typesetting automation.

# Check the charts. WANG beats IBM.

IBM recently announced two new computer systems, the IBM 4331 and 4341. We suggest you take a careful look at both of them.

Because that way, you'll appreciate Wang's remarkable VS computer family and the new VS 100 processors that much more.

Here are some of the things you'll appreciate most:

Major industry analysts consider Wang's VS systems more advanced than IBM's 4331 and 4341.\*

The VS family provides a completely integrated approach to computing with word processing, data processing and telecommunications, all available on the same system.

Wang's VS computers deliver the highest degree of programmer productivity of any system.

The VS has a high degree of compatibility with IBM 370 application software—even higher than IBM products like the System 38 and 8100.

	WANG VS	IBM 4331	IBM 4341	WANG VS 100
Price	\$37,000 (512K CPU)	\$65,000 (512K CPU)	\$245,000 (1 MEG CPU)	\$93,000 (1 MEG CPU)
Performance Index	1.0	1.1	3.7	6.0
Comparable IBM System	138	138	148	158
Operating System	Multi-User Interactive	BATCH	BATCH	Multi-User Interactive
System Expandability	DP, WP, TP	DP, TP	DP, TP	DP, WP, TP
Cache Memory	N/A	8K Bytes	8K Bytes	32K Bytes
Memory Range	128K—512K	512K—1 MEG	2 MEG—4 MEG	256K—2 MEG
On-Line Disk Storage	2.3 Billion Bytes	9 Billion Bytes	18 Billion Bytes	4.6 Billion Bytes
Delivery Date	10 Weeks	1-2 Years	1-2 Years	12 Months

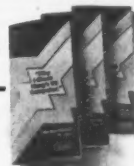
VS interactivity is the highest of any system. That's right, any system.

The VS is extremely easy to use. Any programmer familiar with IBM 370 procedure can become productive in a single day. Even clerks or supervisors with no computer experience become productive within a matter of hours.

The VS can grow from the level of a System 34 to that of a 370/158—without reprogramming, without major equipment swap outs. No other system can do that.

If you'd like to know more about the Wang VS family, including the new VS 100 processor, call us in Lowell, MA, at (617) 851-4111. Or send in the coupon below.

And we'll continue this chart-to-chart talk.

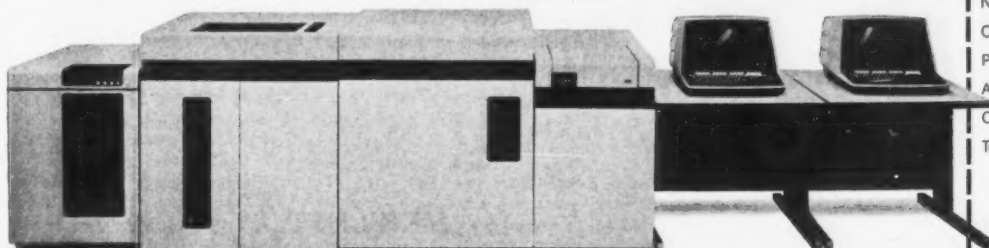


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**WANG**



\*Industry Analysis Report for Executives, Advanced Computer Techniques Corporation, New York, New York.  
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bring the right tools in.**

## **HP decision-maker seminars on business computers can help.**

### **FOR BUSINESS MANAGEMENT:**

#### **Distributed data processing**

Everybody's talking about it, but who's doing it how—and are they doing it right? When you spread out your computing workload to small systems around your company, you have to make sure you put the right computers in the right places. This seminar will explore what is needed for success in a distributed processing program and the experiences of some actual users, along with discussions of how each of the DDP offerings available from Hewlett-Packard may be suited to specific needs in your company. (8:30AM, Day 1)

#### **Data base management**

The information in your computer is a valuable company asset, but only if it's accurate and up-to-date. And only if you can get it when you need it, in a useful form—not after waiting for a printout that tells you far more than you wanted to know. This seminar covers the advantages of using data base management, available in HP systems, to organize and access your business information. (1:30PM, Day 1)

#### **Materials planning and control**

If you're a discrete manufacturing company, you probably are already looking at automating some aspect of your materials management. This seminar will present the advantages of using an on-line system to provide accurate and up-to-date materials planning and control. We discuss the engineering data control, standard product costing, inventory/order status and material requirements planning components of HP's MFG/3000 Materials Planning and Control System. Along with the experiences of some successful users, we will show how MFG/3000 lets you get started without first having to become a computer expert. (8:30AM, Day 2)

#### **FOR EDP MANAGEMENT, STAFF & SOFTWARE OEMs:**

Hewlett-Packard offers a selection of business computer systems, providing a wide range of solutions to end-user needs, as well as a variety of opportunities for the business OEM. Seminars are offered to describe and demonstrate each of these systems in detail.

#### **The HP 250 small business system.**

"Small business computer" doesn't have to signify limited capability, and a powerful system doesn't have to mean a long and difficult programming job. To help get applications software up-and-running quickly and easily, the HP 250 includes programming aids such as Business BASIC language, a complete data base management and inquiry system, forms generator and report writer. HP also offers two application software packages which the OEM or in-house computer specialist can readily adapt to solving specific inventory or order management problems for small to mid-sized manufacturers and distributors. In addition to the choice of memory, peripheral and other hardware options, the seminar also covers the convenience features that make the HP 250 attractive to the end user as well. (8:30AM or 1:30PM, Day 2)

#### **The HP 300 office computer system.**

This seminar provides an opportunity for the OEM/computer specialist to see first-hand

the remarkable capabilities that set the HP 300 apart from other small computers. Its innovative, multiple-"window" display system lets users compare and analyze information to support management decision-making and is an equally invaluable aid to program development. The HP 300 also includes a powerful virtual memory, yet is so compact and easy to use that it fits perfectly into departmental jobs like order processing and personnel management. (8:30AM or 1:30PM, Day 1)

#### **The HP 3000 family of general purpose systems.**

HP's top-of-the-line 3000 Series, with over 2500 systems installed, is probably the most successful "super-mini" machine in the industry. The session will detail the experience of some of these users and will describe the principal members of this software-compatible family—the HP 3000 Series III and Series 33. Capabilities covered will include suitability for on-line transaction processing, data base management, and distributed processing and network applications. (1:30PM, Day 2)

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**HEWLETT  PACKARD**

## Commands Small Business Line

# Model 900 Swells Ranks of Univac BC/7

BLUE BELL, Pa. — Univac added another soldier to its BC/7 army that it said is more powerful than the other comrades in those ranks.

The fourth member of the BC/7 small business computer family, the BC/7-900, offers a beefed-up multiprocessing environment, a 100% increase in job throughput and the capability to handle more workstations than Univac's previous top-of-the-line model, the BC/7-800, the vendor claimed.

Although the Model 900 incorporates many of the same features included in the BC/7-600, 700 and 800, it offers an enhanced CPU. The Intel Corp. 8080-based 3048-57 processor has a main storage capacity of 256K bytes of MOS memory compared with the Model 800's 128K bytes and is "virtually" 1.5 times faster, a spokeswoman claimed.

The older Univac business systems offered a memory access time of about 500 nsec/byte; the BC/7-900 accesses two bytes in the same time frame, she said.

The Model 900's updated processor also represents an "architectural" change from the Model 800. In the previous system, the processor was composed of two chips — an

interpretive macro processor that dealt primarily with character mode instructions and a control unit processor that took care of the binary and control instructions. One chip now performs both duties, the spokeswoman said.

### Juggles Four Jobs

The 3048-57 chip also does away with the "roll-in, roll-out" job control functions that were inherent in Univac's 600, 700 and 800 models. Before, if two applications were running in the processor and a higher priority job was entered, the computer would put the lower priority job in a state of limbo and transfer the machine's resources to the new job.

"At any one time, only two jobs could be running, but the system could keep track of four, swapping them in and out as the priorities changed," the spokeswoman explained.

In the 900, however, up to four jobs can be juggled at the same time without compromising run speed or priority, she said.

Like the other Univac minis, the BC/7-900 is targeted to compete with the IBM System/34, Burroughs Corp. B80 and B800,



The Univac BC/7-900

NCR Corp. 8230 and 8250, Basic/Four Corp. models 400 and 600 and other similar systems. Considered a natural upgrade, the BC/7-900 was not introduced to pull the rug out from under competing minicomputers, according to Univac marketing strategists.

"The product was ready, and we wanted to supply it to our customers," the spokeswoman observed. "We felt there was a need."

A typical BC/7-900 system with 256K bytes of main memory, 40M bytes of disk storage on two drives, 4M bytes of diskette storage and four workstations costs \$76,587 or \$1,846/mo on a five-year lease. First deliveries are scheduled for the second quarter

(Continued on Page 56)

## Wholesaler Saves by Trading File Cards for Computer Files

By Jeffrey Beeler

CW West Coast Bureau

MISSOULA, Mont. — Even though its product line grew from 400 to 900 items, a building materials wholesaler here was able to keep the size of its clerical staff constant by computerizing its inventory control and other applications with its first small business system.

If it had not installed the in-house system, Independent Lumber & Supply, Inc. would have had to hire two additional clerks to accommodate the 225% growth in its inventory, according to Mike Nash, the firm's accountant. Two extra clerks would have cost the company about \$18,000 per year.

In addition to holding down Independent's inventory control expenses, the small business system has reportedly speeded the production of quarterly and year-end reports, cut the cost of generating invoices and provided several types of sales reports that were previously unavailable to the firm.

Before it acquired its small business system, Independent monitored its stock with a manual card file system. The manual system proved adequate for the wholesaler's inventory control needs for years, but trouble developed about three years ago when a building boom swelled the firm's volume of on-hand stock.

### 'Suspected Something Wrong'

"We began to suspect something was wrong with our inventory control system when we discovered that we had sold the same load of plywood to three different customers in the same day," Independent's Florence Hamp recalled. "It became difficult for our three inside salesmen to keep track of what we had in stock, what was on order or what had been shipped to customers."

"Inventory cards were often misplaced. There were instances when a salesman would sell an order based on what he believed to be an up-to-date record, not knowing that one of the other men had sold the same inventory to another customer but had not yet updated the card."

Independent also experienced problems in

producing its invoices. Under the firm's earlier manual system, three clerks devoted themselves almost wholly to invoice production. In fact, the job took so long that the clerks had practically no time for other accounting tasks, Nash said.

(Continued on Page 56)

## Minis Help in Test of Systems To Avert Midair Plane Crashes

DENVER — While computers haven't yet replaced jet pilots, they are playing a major role in aviation tests aimed at preventing midair collisions.

Studies conducted with a Boeing 727 jet flight simulator at the United Airlines Flight Training headquarters here utilized minicomputers to help determine the most desirable characteristics of a cockpit-mounted collision warning system. Three types of warning systems were tested.

The tests placed flight crew members in a simulated Boeing 727 cockpit controlled by a specially designed minicomputer system that generated a three-dimensional model of the airspace through which the crew was supposed to be flying. The crew was then given visual indications of approaching aircraft that might be on a collision course.

The studies were conducted here at United Airlines' flight training headquarters by Arinc Research Corp. of America under contract with the Federal Aviation Administration (FAA). The Arinc system, incorporating a Digital Equipment Corp. PDP-11/34 minicomputer, was linked to another PDP-11 built into the simulator to coordinate the visual presentations to pilots participating in the tests.

The simulated flights were made at "night," and oncoming aircraft were displayed by the proper navigation ("recognition") lights. Up to six aircraft were displayed simultaneously in the cockpit windows.

A number of professional airline crews, re-

presenting several airlines, were used in a variety of tests that simulated flight between actual airports.

The conflicts with other aircraft occurred in the traffic pattern of the airports, en route between airports or both, at the discretion of

(Continued on Page 56)

## Bus Moves Data Between Novas

ANAHEIM, Calif. — A full-duplex bus system that allows data transfer between Data General Corp. Nova CPUs is available from Mini-Computer Systems, Inc. (MCS).

The Model 2004 Interprocessor Adapter (IPA) employs a master/slave concept to permit separate and unrelated simultaneous data transfer. The slave CPU will passively transfer data by IPA in either direction.

The Nova CPU and the associated IPA protocol determines the speed of the data transfer, which can range up to 1M bit/sec per channel. Since two channels operate simultaneously, the maximum data rate can be up to 2M bit/sec, the vendor noted.

The Model 2004 IPA costs \$2,495, MCS said from 2259 Via Burton, Anaheim, Calif. 92806.

MINI-REPORT



# DP Saves Wholesaler \$18,000 in Clerical Costs

(Continued from Page 55)

To make matters worse, the manual accounting system seldom gave the company's staff an opportunity to compile the statistics they needed to produce sales reports. As a result, Independent rarely received up-to-date sales reports, if it got them at all.

Unable to tolerate its data processing shortcomings any longer, Independent replaced its manual accounting methods with a Digital Equipment Corp. Datasystem 310, which it acquired from Alpha Omega Systems, Inc., a local distributor. Built around a 16K-char. DEC PDP-8, the Datasystem 310 incorporates a VT50 Decscope CRT terminal, a 180 char./sec Decwriter printer and two floppy disk units that store a total of 1.35M characters.

Since it installed its small business system, Independent has cut the time needed to prepare its quarterly and year-end reports from two or three hours to about one hour, Nash said.

The system has also helped the wholesaler generate its invoices on the same day it ships its orders. Under the previous accounting system, invoice production lagged at least two days behind the company's customer shipments.

Among its other advantages, the small business system has enabled Independent to generate an assortment of up-to-the-minute sales reports on demand, Nash noted. One of these reports, for example, lists year-to-date purchases for each of the firm's customers, while another report contains

similar information about each of the company's suppliers.

Still to come are programs that allow the wholesaler to track the gross margins for each of its products and thus pinpoint the most profitable items in its line. Plans to develop these profit report programs are under way.

For most of Independent's current programs — inventory control, invoic-

ing and accounts payable — Nash relied heavily on Alpha Omega's software assistance. The company's general ledger program, however, was entirely the result of his own work.

Nash also doubles as his firm's computer operator and produces a current inventory report at least once a week, with more frequent updates provided on demand.

## Minis Help Test Systems To Avert Midair Collisions

(Continued from Page 55)

the testers. Participating crew members were not given information ahead

of time on conflict situations.

Three types of warning displays were tested: a dial-and-pointer unit, an alphanumeric display built around light-emitting diodes and a radarscope-like video display.

The system concept under development by the FAA is called the Aircraft Separation Assurance (ASA) system. It uses both a ground-based and an airborne system to detect the position and motion of aircraft in flight, then sends warning data to appropriately equipped aircraft.

The Arinc Research simulation program showed the crew the same warning data on cockpit indicators as each proposed system would reveal, while the PDP-11/34 system duplicated all aspects of the indicators, including an audible alarm.

The PDP-11 in the aircraft simulator, connected to the Arinc Research system via a Unibus "window," permitted the Arinc Research system to receive data from the simulator regarding the 727's flight position. That hookup also enabled the simulator system to receive data on the position of the "intruding aircraft."

The Arinc system also gave flight crews perspectives of simulated aircraft and generated warning data so crews could take evasive action.

Arinc Research used DEC's RSX-11M operating system for the development of its applications programs, which permitted the PDP-11/34 to perform the simulation of intruder aircraft both in terms of display and as part of the ASA system simulation.

Flight results were collected by the Arinc Research system for each run and stored on tape for later analysis. Computer-collected data on flight operation and crew response was correlated with data from questionnaires filled out by participating crew members.

The results of the initial test series are currently being evaluated.

## Model 900 Caps Univac Line

(Continued from Page 55)

of 1980.

The BC/7-800 can be field-upgraded to a Model 900 in "about four to eight hours" with an enhancement "kit" that is priced at \$1,300 for Model 800 owners and an additional \$167/mo for users who lease. The fees include all charges for Univac field engineers and software representatives.

Univac can be reached through P.O. Box 500, Blue Bell, Pa. 19424.

## Our international publications reach a two billion dollar international market for U.S. computer products and services.

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They include seven of the largest computer using countries in the world, and two of the fastest-growing. And they all rely heavily on U.S.-made computer products. Imports are currently running at more than two billion dollars, and growing rapidly. Mainframe shipments are growing at 8% a year, with even higher growth rates for products such as small systems (20%) and minicomputers (36%). And the total CPU installed base in these eight countries is expected to top 45 billion dollars by 1981!

Country	Installed Value of General Purpose Computer Systems	% of total world value	World Rank as DP Market
United States	\$50,100,000,000	45.5%	1
Japan	8,531,000,000	10.0	2
U. Germany	6,587,000,000	7.9	3
United Kingdom	4,794,000,000	5.8	4
France	4,768,000,000	5.8	5
Canada	2,301,000,000	2.8	7
Italy	2,119,000,000	2.6	8
Australasia	2,044,000,000	2.5	9
Brazil	539,000,000	.8	17

Obviously, these are excellent marketplaces for American manufacturers, and you can reach key buying influences in one of them, some of them, or all of them through us. As publishers of Shukan Computer, Computerwoche, Computer Management, Australasian Computerworld, and DataNews; and sole U.S. representatives of the French, Italian, and Canadian publications — we can give you one-stop advertising in these eight marketplaces — including translation and production services. We'll also bill you in dollars — so it's as easy as advertising in U.S. publications.

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## Price Includes Training, Maintenance Western Micro Bundles Small Business Systems

CUPERTINO, Calif. — A small business systems family whose hardware, software, maintenance, installation and training are sold together for a single price is available from Western Microsystems, Inc.

By providing "bundled" systems, Western Micro differs from many

### Printer/Plotters From Versatec Tied to HP 3000

SANTA CLARA, Calif. — Carrying its own line printer emulation circuitry, independent power supply and required cabling, a printer/plotter interface from Versatec ties Hewlett-Packard Co. Model 3000 Series I, II and III processors to any of Versatec's electrostatic plotting machines.

The Model 155 interface has electrical and mechanical specifications compatible with the standard HP I/O structure, a Versatec spokesman stated. The device utilizes HP's Subtype 2 line printer driver for printing and plotting and is supplied with the computer firm's 30209A universal I/O card.

Software for the interface is supplied on 9-track, 800- or 1,600 bit/in. magnetic tape. A software exerciser included with the interface provides for testing of all printer/plotter and interface functions, the spokesman continued.

Versaplot software, integrated for use with HP's operating systems, provides on-line and off-line electrostatic plotting capabilities. Versatec's machines offer print speeds up to 1,200 line/min and plot speeds up to 34 square ft/min.

HP 3000 users with HP 2640 series terminals can use the Model 155 interface and Versatec's 1640 hardcopy system to make hard copies from up to eight of the terminal stations, the spokesman claimed.

Standard cabling provides for a 20-ft distance between the interface and the HP universal interface card and another 20 ft between the interface and a printer/plotter. An optional long-line driver extends cable lengths to 1,000 ft.

The Model 155 interface costs \$5,500 from Versatec, 2805 Bowers Ave., Santa Clara, Calif. 95051.

### Floppy Controller Subs For RK, RX Systems

SANTA CLARA, Calif. — Boasting up to 5M bytes of storage capacity with four double-sided floppy drives, Tecma, Inc.'s 2+2 controller can simultaneously emulate Digital Equipment Corp.'s RK cartridge and RX flexible disk systems.

The controller was designed for DEC's PDP-11 processors.

The 2+2 is software-transparent and will function with DEC's operating system.

Manufactured by Xebec Systems, Inc., the double-density dual-disk controller costs \$3,950, while the double-sided version is priced at \$4,450. Tecma is at 2366 Walsh Ave., Santa Clara, Calif. 95051.

other small business systems suppliers, which still charge separately for their hardware, software, service and support.

In fact, Western Micro — a self-described "systems marketing company" that serves alternately as a distributor, representative and broker — claims to be the only firm of its type to offer a "complete small business systems package" for a lump sum.

But because the company restricts its sales and support to one region, its family of systems are available at present only in northern California and the Reno, Nev., area.

Aimed primarily at businesses whose annual revenues range from \$500,000

to \$10 million, the systems series provides a choice of hardware and software options that users can combine to form custom-built configurations. Partly because of this variety of hardware and software combinations, the systems family has no formal name, at least for the time being.

#### Assortment of CPUs

On the hardware side, the series offers assorted microprocessor-based CPUs including the Digital Equipment Corp. LSI-11/02 plus the Intel Corp. SBC series, Zilog, Inc. MCZ series and Altos Computer Systems, Inc. 8000 series models. Random-access memory for those machines ranges from 32K to

64K bytes.

Disk systems available with the configurations include Altos, Motorola Corp. and Zilog models with up to 1M byte of dual floppy disk storage.

A typical Western Micro system incorporates one TEC, Inc. Series 70, TEC Series 500 or Applied Digital Data Systems, Inc. Regent 100 terminal, although other models including the Lear Siegler, Inc. ADM-3 terminal are also available.

For applications not involving word processing, the systems family typically incorporates a Texas Instruments, Inc. 810 printer, while jobs that do entail word processing typically call for

(Continued on Page 58)

## More maintenance for less money

As an owner of an IBM computer system, you can purchase your maintenance agreement from either CMLC or IBM. Both companies insure that your systems will be well maintained by IBM engineers using IBM parts. A CMLC maintenance agreement offers more advantages...at considerably less cost than the IBM maintenance agreement.

### Preventive Maintenance

Maybe we're old fashioned, but we believe that a thorough preventive maintenance program is essential for the satisfactory operation of your computer equipment — especially if you have an older system. Are you now receiving all the PM you are paying for with your IBM maintenance agreement? Do you even know all the PM that is recommended for your equipment? Many people say no! At CMLC, we believe a good PM program is in our mutual self interest. That's why we provide each customer with all of the PM routines and frequencies recommended by the manufacturer. We also provide easy to use PM schedule and completion logs which show the complete annual PM program to be scheduled at your convenience.

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CMLC has extended maintenance coverage to 11 hours Monday through Friday, from 7am to 6pm. Now you can get started a little earlier or work a little later without worrying about astronomical overtime charges. CMLC gives you 40 extra hours of coverage every month — 22% more than IBM for a lot less money.

### Mechanical Replacement

Lets face it. Once in a while, a machine is just a "lem-on"! A machine with constant problems isn't good for either of us. That's why a CMLC maintenance agreement provides for mechanical replacements of chronic "problem" machines. We would rather exchange machines and end your problems once and for all.

CMLC is now in its fourth year of writing maintenance agreements on IBM computer equipment. During that time, our customers have saved many thousands of dollars while receiving high quality maintenance from IBM. IBM recently announced maintenance price increases on many of their machines. If you think its about time your maintenance costs went down instead of up, please give us a call.



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## Fixed Head-per-Track Disk Systems Fit PDP-11, LSI-11

IRVINE, Calif. — A family of fixed head-per-track disk subsystems, reportedly software-transparent to Digital Equipment Corp.'s RJ504 and RWS04 subsystems, has been introduced by Emulex Corp.

The three basic subsystems are the SS01/F, SS11/F and SS70/F for the LSI-11, PDP-11 and PDP-11/70 computers, respectively. All subsystems incorporate a standard Emulex disk controller and a Control Data Corp. Model 9733 fixed head-per-track Mini Module Drive.

The SS01/F includes an Emulex SC01 controller which is embedded in a standard LSI-11 quad backplane and interfaces to the Q bus. The SS11/F incorporates an Emulex SC11 controller which is embedded in a pair of SPC

slots and interfaces to the Uni-bus.

The SS70/F incorporates an Emulex SC70 Controller embedded in three RH70 slots of the PDP-11/70; it interfaces to the cache bus.

### System Capacities

Each subsystem model is offered in either 2M- or 4M-byte configurations on a single drive. Multiple drives may be incorporated on a single controller.

For example, the SS01/F can incorporate up to two drives for a system capacity ranging up to 8M bytes; the SC11/F can incorporate up to four drives for a system capacity up to 16M bytes; and the SC70/F can incorporate up to eight drives for a system capacity of 32M bytes.

The SS01/F and SS11/F models of the series carry the same list prices of \$23,500 and \$32,500 for 2M-byte and 4M-byte capacities, respectively. The 2M-byte version of the SS70/F subsystem costs \$25,000 and the 4M-byte version is priced at \$34,000.

Volume discounts of up to 40% are available for all models, Emulex noted.

The SS01/F and SS11/F are available now, while the SS70/F will be available in September from Emulex, 17785 D Sky Park Circle, Irvine, Calif. 92714.

## Distributed Processing Topic of Seminar

CHICAGO — The University of Chicago's Center for Continuing Education will offer a three-day intensive seminar on minicomputers and distributed processing in Atlanta on Aug. 13-15 and in New York on Sept. 24-26.

Covering everything from the basics of minicomputer technology to the definitions and concepts of word processing and mini-based systems, the course is designed to examine the uses, economics, programming and implementation of small computers, a spokesman stated.

Included in the course will be discussions on general-purpose registers; memory mapping, paging and virtual memories; magnetic disk and tape drives; plotters; high-level languages; hierarchical control and communications; front-end systems; and packet switching.

The sessions cost \$545 per person plus a \$65 registration fee per organization. Additional information and registration material is available from the university's Center for Continuing Education, 1307 E. 60 St., Chicago, Ill. 60637.

## Western Micro Bundles Systems

(Continued from Page 57)  
a Diablo Systems, Inc. 1610 printer.

Typical users of the systems series will include retailers and wholesalers as well as professionals like doctors, lawyers, dentists and accountants. In processing power, the line compares roughly to the IBM 5110, DEC Datasystem 300 and the low end of the

Hewlett-Packard Co. 3000 series, a Western Micro official said.

As for software, most members of the company's small systems family, except for the LSI-11/02-based configurations, run under Digital Resource, Inc.'s CP/M operating system.

Application software for the family will come from the

Oakland-based Structured Systems Group and California Micro Systems, Inc. of Chico, Calif. Both software houses will provide application packages for the standard accounting functions as well as for mailing lists and data bases.

Prices for the Western Micro small business systems differ widely because of the variety of configurations available. But a typical member of the line, like a 64K-byte Altos 8000-2 system with a 1M-byte floppy disk unit, costs \$10,000 to \$20,000, the spokesman said.

Western Microsystems is located at 10040 Bubb Rd., Cupertino, Calif. 95014.

## Reader, Two Interfaces Announced for PDP-8

FRAZER, Pa. — Cardamation Co. has announced two card interfaces as well as a card reader for use with Digital Equipment Corp.'s PDP-8 minicomputer.

The CR300/81 punched card reader is reportedly equivalent to DEC's CR8 card reader, but offers a 40% to 50% saving. It is also said to be available more quickly than DEC's machine; specifically, it is deliverable 30 days after ordering.

The reader will operate under the CR8 software handler and diagnostics. It is both hardware and software plug-compatible, a spokesman noted.

It costs \$3,690; the price for four or more is \$2,805 each.

The 80D interface, the first in a family of products that will operate with 80-column Inc. allows all M series Documentation card readers manufactured by Documentation card readers to operate with the PDP-8.

The interface will also operate with readers manufactured by Cardamation itself. The 80D costs \$700.

Feature 21 is an Ascii parallel output for Cardamation card readers that precludes the necessity of Hollerith-to-Ascii software conversion in a microprocessor or terminal to which the card reader is connected, the firm said.

It costs \$325.

Cardamation Co. is located at 9A Frazer Mall, Frazer, Pa. 19355.

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## Micro Bytes

### Power Interfaces Cut Downtime

LONG BEACH, Calif. — A series of computer power interfaces that isolate, regulate and filter power output between a standard wall outlet and terminals, minis or microcomputers has been introduced by Computer Power Systems Corp.

Micropower can greatly reduce terminal and microcomputer downtime caused by power line fluctuation, disturbances and transients, the vendor claimed.

Additional features include a soft/start capability which eases turn on/off stress in the connected equipment.

The Micropower costs \$750 from Computer Power Systems Corp., 3398 E. 70th St., Long Beach, Calif. 90805.

### Mark-Sense Card Reader Linked to S-100 Micros

CHATSWORTH, Calif. — An S-100 bus interface for the Chatsworth Data Corp. MR-500 mark sense card reader for microcomputers is now available.

With the interface, the MR-500 provides S-100 systems with an alternative to keyboard data entry. Cards of any length are accepted and marked with a standard No. 2 pencil.

The MR-500 with S-100 bus interface costs \$895 from the firm at 20710 Lassen St., Chatsworth, Calif. 91311.

### Percom Software Goes On Two Vendors' Disks

GARLAND, Texas — Users of Southwest Technical Products Co. and Smoke Signal Broadcasting Co. minidisk systems can now make use of Percom Data Company, Inc. disk software through an upgrade/conversion package developed by Percom.

The conversion package includes Percom's LFD-400/800 controller-interface printed circuit card; two disk operating systems, Minidos and Minidos-PlusX; Percom Super Basic; a cable connector; and a set of instruction and user manuals.

The conversion package costs \$249.95, and orders can be placed through Percom's toll-free number, (800) 527-1592. The firm is located at 211 N. Kirby, Garland, Texas 75042.

### Case Holds Cassettes

COMMACK, N.Y. — A shatter-resistant cassette attache case for use in computer, word processing and audio markets has been introduced by the Data Products Division of Robins Industries Corp.

Designed to hold 16 cassettes, the case is made of heavy-duty, high-impact plastic to withstand abuse in transit.

The cassette attache case, catalog No. 34-000, costs \$3.10 from Robins' Data Products Division, 75 Austin Blvd., Commack, N.Y. 11725.

## Personal Computers May Find New Home in Large Firms

PALO ALTO, Calif. — Low-cost technology combined with the need for immediately available data processing facilities may trigger a new phenomenon in computing — the use of small-scale dedicated computers by the ultimate end users in large firms.

According to Input, a consulting firm based here, the dedicated computers will come from those supplied for personal use. In such a dedicated mode, these computers will offer their users immediate accessibility and will cost less than \$10,000 — sometimes much less, according to Input.

The ultimate user is the manager or professional who uses computer-supplied information in the performance of his job. He is the person presently served by an in-house DP function or by outside computer services vendors. He now has the third option of obtaining his own dedicated machine at a price he may be

able to afford out of his own budget, Input suggested.

Corporate management in general and DP managers in particular are now in the process of deciding what role they should play in the distribution and support of these new machines to the professional and managerial employees of their companies. The outcome of the decisions they make now may significantly influence the future courses of the DP industry, Input maintained.

Input is initiating a major multiclient study which will address this issue and analyze the developments which will influence the success or failure of the dedicated computer in the big corporation environment. The study is entitled "Dedicated Computers for the Ultimate User."

A copy of the study proposal is available from Ron Blaisdell at Input, Suite 600, 2471 E. Bayshore Blvd., Palo Alto, Calif. 94303.

## Time Accountant, General Ledger Microsource Adds Software

TEMPE, Ariz. — Microsource, developers and distributors of software packages for the small business market, has announced a time accountant system for professionals using North Star-based systems and a general bookkeeping package for users of Data General Corp., Vector Graphic, Inc., Apple Computers, Inc. and Radio Shack microcomputers with Micropolis disk drives.

The \$599 time accountant package, known as Timekeeper, offers multiple billing rates of up to four per staff member, a cash receipts journal, work-in-pro-

gress reports by work type and non-billing totals, the company said.

It also provides partial, full or fixed-fee billing options with unlimited message insertions.

The system generates a timesheet input journal with performance reports by staff member and work type. Data for as many as 60 employees and 800 clients can be stored on one 5-in. double-density disk, Microsource said.

Ledgerplus consists of general ledger, accounts receivable, accounts payable, payroll, check reconciliation, inventory control

and mailing list applications, the firm said. All of the modules can be used either separately or in conjunction with the others.

Modules for DG and Vector Graphic equipment retail for \$495; the modules for Apple II and TRS-80 systems cost \$295.

Both packages were designed for users without computer expertise. No operator training is required, Microsource said.

Timekeeper and Ledgerplus are available through some computer stores. For exact locations, contact Microsource at 1425 W. 12 Place, Tempe, Ariz. 85281.

## C Compiler Built for Intel 8080

NEW YORK — A full C compiler for the Intel Corp. 8080 microcomputer is now available from Whitesmiths, Ltd. Accompanying the compiler are a complete set of runtime support routines, the firm's Portable C Library, an interface library for operation of C under either the CP/M or Isis-II operating systems and a translator for A-Natural, the narrative assembly language.

The compiler is currently available as a cross-compiler running on the Digital Equipment Corp. PDP-11 under RSX-11M, RT-11, RSTS/E and IAS. Operating in three sequential passes, it

produces an A-Natural code, which is then translated to assembly language that is compatible with Intel's ASM80 and Microsoft, Inc.'s Macro80.

Source code can also be written in A-Natural for processing by the same translator.

A standard cross-compiler package is available for \$700 per binary CPU license. This includes the C compiler and PDP-11 support package, the A-Natural translator and the runtime library for use on a single 8080.

Use of the minimal machine in-

terface library on additional microcomputers is available for \$10 per CPU in small quantities.

Whitesmiths, Ltd is located at 127 E 59 St., New York, N.Y. 10022.

## MTOS-86 Has Real-Time Multitasking

GREENVALE, N.Y. — MTOS-86 is the latest in Industrial Programming, Inc.'s line of real-time, multitasking operating systems for microprocessors.

Application programmers can call for MTOS-86 services via PL/M or assembly language statements. MTOS-86 facilities include memory management, an unlimited number of tasks, event flags, networking and support for multiprocessor configurations, the firm said.

MTOS-86 costs \$950 in object language form and \$4,000 in source language form. A user's manual is available for \$15 from Industrial Programming, 9 Northern Blvd., Greenvale, N.Y. 11548.

## Intel Upgrades Software For Development System

SANTA CLARA, Calif. — Intel Corp. has doubled the performance of three software products used to develop 8080/8085 microcomputer programs on its Intel Microcomputer Development Systems.

Version 3.0 of the 8080/8085 Macro Assembler allows 8080/8085 programs to be assembled in half the time formerly

required, the firm claimed. The Link and Locate packages of the Inteltec operate at twice their former speed as well.

Version 3.0 is available at no cost to registered users of Isis-II. Free registration can be requested by those users who have previously not done so.

Intel is at 3065 Bowers Ave., Santa Clara, Calif. 95051.





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## Apple Planning to Offer Same-Day Repair Service

CUPERTINO, Calif. — A nationwide repair program featuring same-day computer repairs is being inaugurated by Apple Computer, Inc.

Level I service of the three-tier program will be given by a local dealer; Level II repairs will be made at a regional distributor; and Level III service will originate from the Apple Service Center at Apple's headquarters here in Cupertino.

Most repairs can be diagnosed by computer with the guidance of a dealer, and this local repair will cut down on time, the firm stated. The program is scheduled to be in effect by Oct. 1.

Dealers spare parts supplies are as-

sured through Apple's Modular Parts Exchange Program, the company said. A dealer simply replaces a damaged part with a new one by mailing it to the Apple Service Center; the enclosed dealer reorder card ensures that exchange parts arrive by return mail.

An on-line order entry, inventory control and shipping system at the Apple factory backs up Apple's ability to offer fast parts shipments, the vendor said.

Apple Computer is located at 10260 Bandy Drive, Cupertino, Calif. 95014.

## 'Source' Lists TRS Software

LAKE HAVASU CITY, Ariz. — Computermat has released an updated version of the "Radio Shack TRS-80 Software Source" containing more than 3,000 listings of TRS-80 software available from 200 vendors.

The TRS-80 Software Source is intended to help TRS-80 owners locate specific programs. The listings are cross-indexed and divided into five sections: alphabetical program listings by supplier; alphabetical program listings by subject; program listings by Basic and memory; program listings by disk; and suppliers' names, addresses and phone numbers.

Subscription price is \$10 per year for three issues or \$4 per issue. Distributors of TRS-80 software can be listed in the directory at no charge. They can contact Computermat for information at Box 1664, Lake Havasu City, Ariz. 86403.

## Extension Built For North Star

STATE COLLEGE, Pa. — Interactive Microware, Inc. has added a North Star disk operating system extension to its library of software packages.

DOS+ enables any program to execute all North Star disk commands, either individually or in combination, and also provides a protocol for the transfer of Ascii data between programs and I/O devices.

DOS+ is available with a manual and North Star diskette for \$35. Interactive Microware can be reached at P.O. Box 771, State College, Pa. 16801.

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# Moves in the Offing? Energy Problems Threaten Silicon Valley

By Jeffery Beeler  
CW West Coast Bureau

SACRAMENTO, Calif. — Some of the firms that have contributed to Silicon Valley's rapid growth and made it the high-technology capital of the world might have to start taking their business out of state unless California can solve its growing energy problems.

Hewlett-Packard Co. Chairman David Packard and Memorex Corp. Chairman Robert Wilson issued that warning during a recent hearing before State Energy Commission Director Richard Maullin and his staff. Both Packard and Wilson questioned the state's long-term ability to ensure a steady flow of electricity to northern Santa Clara County, which boasts the world's densest concentration of semiconductor and computer equipment manufacturers.

In a prepared statement, Packard criticized the quality of the state's energy planning and termed the commission's energy consumption forecasts "unrealistic."

Wilson later echoed the HP executive's sentiments when he quoted the results of a recent survey predicting that electricity use among Silicon Valley firms would jump 6.1% per year between 1978 and 1984. The survey, which involved 32 northern California high-technology companies, further forecast an 8.8% annual increase in power

consumption between 1978 and 1981 and a 3.5% rise between 1981 and 1984.

## HP Expansion Plans Affected

California's inadequate energy policies have played a major role in HP's growing trend to seek plant expansion sites outside the state, Packard said. Of five HP plants now on the drawing board, only one — a large facility near Roseville — is earmarked for California.

Moreover, the company might have to abandon its planned Roseville plant if the federal Nuclear Regulatory Commission refuses to approve the controversial Diablo Canyon nuclear power station near San Luis Obispo, Packard warned the commission.

Packard and Wilson spoke here as representatives of the Santa Clara County Manufacturing Group, an association of 50 Silicon Valley companies employing some 127,000 workers. In his address before the commission, the HP chairman urged state energy planners to increase the amount of power held in reserve for peak demand periods. California utilities have collectively recommended a minimum reserve capacity of 15%, but that level is far "too low" for comfort, Packard said.

HP and other Silicon Valley firms "must have an adequate, reliable supply of electricity" to meet the rapidly growing demand for

their products, he added. "I am not confident that we have that assurance."

Packard urged Maullin and his commission to raise the state's minimum power reserve ceiling to 25%. At their current low levels, the state's reserves leave Silicon Valley's high-technology companies little margin for energy safety and increase the risk of a serious power shortage.

## Crippling Blow

To date, northern California's semiconductor and computer equipment companies have weathered tight electricity supplies with little hardship, but the past offers little guarantee of a secure energy future.

A serious disruption of Silicon Valley's power flow could deal a crippling blow not just to the high-technology field itself, but to much of the U.S. economy in general. "Interruptions in electric power directly affect our productivity and can lead to costly plant shutdowns in which in-process materials are destroyed or manufacturing equipment is damaged," Packard warned.

The HP executive also chastised the state commission for maintaining unacceptably low power reserves to force conservation. Although he urged continued efforts to save energy whenever possible, Packard told his audience not to expect too much of conservation. "We have learned that there is a limit to how much can be done to conserve through better controls and better design of plants and offices," he said. "The most effective conservation measures have already been taken."

Furthermore, he noted, the circuitry that is just emerging in the electronics field will require even more energy to produce than the technology it will replace.

Thus, Packard urged California's energy planners not to overrely on conservation as a means of maintaining the state's power reserves. If this overreliance continues, it could threaten "significant" numbers of jobs and result in "economic dislocation for a very significant segment of the state's industrial sector," he warned.

# Net of Maintenance Franchises Eyed by Raytheon Service Co.

By Marcy Rosenberg  
CW Staff

BURLINGTON, Mass. — Spurred by the growing use of distributed data processing (DDP) and the resulting need to support remotely located computer systems, Raytheon Service Co. plans to form a network of maintenance franchises.

To set the ball rolling, the Raytheon subsidiary converted its existing Canadian computer maintenance operation to an independent franchise, Rayserv Computer Services, based in Toronto to cover the province of Ontario.

The five Canadian service employees will be retained and paid directly by the franchise, headed by Willem J. Grobben, who was manager of the operation when it was part of Raytheon.

Rayserv is the first of two franchises the firm expects to launch this year, according to Michael Ruettgers, general manager of computer services for Raytheon Service Co. The second will be a U.S. franchise to be located on the West Coast and formed either through a similar conversion or from an outside venture, Ruettgers said.

Raytheon Service chose to open its premier maintenance franchise in Canada, Ruettgers said, because Grobben expressed an interest in the project and possessed the necessary financial resources and business experience. And, as a former Raytheon employee, Grobben "was a known quantity to us and we to him."

Under Raytheon's franchise policy, the firm will charge a flat franchise fee "in excess of \$10,000" and collect royalties based on a fixed percentage of franchise sales, an amount Ruettgers would not disclose.

Franchisees will also have the option to purchase — for equipment traditionally serviced by Raytheon only — various company services such as marketing, training, technology and logistics support as a backup to their own sources.

Raytheon Service currently provides maintenance for the IBM 360/30 through 68, IBM 370/135 through 158 and Honeywell, Inc. 200 and 2000 series systems; it may add the Honeywell 6000 series to that roster. But as a single-source maintenance firm for mixed-vendor systems users, the firm also supports all other equipment in the same computer room, Ruettgers explained.

(Continued on Page 62)

# Viatron Autopsy to Continue In District Court Next Month

By Marcia Blumenthal  
CW Staff

BOSTON — Although Viatron Computer Systems Corp. died long ago, its autopsy is still being performed. Next month the U.S. District Court here will determine the fairness of a partial settlement of two class action suits brought by investors in the defunct firm.

These suits seek to recover damages from the underwriters of Viatron's public offerings, its auditors, suppliers, consultants and others.

Without admitting wrongdoing, the underwriters are the only group of defendants to date to offer to settle with the plaintiffs. They have proposed a \$1.85 million settlement, and the adequacy of this offer will be determined by the court.

Viatron made headlines back in 1968 by proclaiming itself the General Motors of the DP industry. Founded by a group of scientists from Mitre Corp., Viatron rented terminals to users at the then-unheard-of low price of \$39/mo.

Depending on the options users selected, they could obtain a relatively sophisticated data entry system for \$116/mo. This

system — one of the first inexpensive alternatives to keypunching devices — was well received by users.

Dr. Edward M. Bennett, founder and president of Viatron, wanted to bring computing power to the masses, making computers as convenient to use as telephones.

In addition to the System 21 terminal, Viatron also rented a processor for \$99 to \$199/mo. This system was based on LSI/MOS circuitry.

Mass production and low monthly rental prices were the seeds of Viatron's strategy. Because of this unique concept, the firm received publicity and visibility out of proportion with its size or financial strength.

However, those seeds failed to bloom. By the middle of 1970 Viatron had sold only 500 terminals. The company reportedly should have been able to produce 1,500 to 1,800 terminals.

Although investors sank about \$36 million into the company, Viatron's losses exceeded \$20 million by the end of 1970. During that year, the firm was forced to

(Continued on Page 65)

COMPUTER INDUSTRY



## National Semi to Make More Scanners

SUNNYVALE, Calif. — National Semiconductor Corp. has launched an expansion program to boost by 500% its production of Datachecker point-of-sale (POS) scanner systems.

Citing increased demand for its Bar Double X scanners, National Semi enlarged production space by 300% from 50,000 to 150,000 square feet at its Systems Division facility here, the plant responsible for manufacturing POS products.

Also as part of the expansion, the company approximately doubled its production staff, increased its field service organization from 300 to 400 employees in the past year and plans to add more automated board

testing capabilities, according to John Humphreys, Systems Division director of marketing.

Currently a "small" part of National Semi's POS activities, the scanner system business is "taking off," Humphreys observed. He said the firm is gearing up to ship 25 Datachecker scanners per month by September, an increase from the five per month a year ago.

Humphreys maintained customers "have moved into volume purchasing" of scanner systems, primarily those found to increase employee productivity by reading on the first pass problem product codes such as labels on cellophane or wax cartons.

Giving high marks to the Bar

Double X scanner in this area, Humphreys added that the Datacheckers are priced competitively — if not slightly below — comparable products on the market. An eight-lane, single-disk system with one power supply costs \$80,000; an eight-lane system with dual disks and power supplies costs \$100,000.

National Semi, which also manufactures POS systems without scanners as well as stand-alone electronic cash registers (ECR), claims to have captured a 27% share of the grocery store market for all POS terminals and "sophisticated ECRs that can be upgraded to POS," according to Humphreys. He pegged that market at \$200 million.

## Raytheon Eyeing Upkeep Network

(Continued from Page 61)

However, Raytheon Service will not offer backup support to franchisees for equipment they choose to service in addition to these IBM and Honeywell systems.

While the need to broaden the scope of available customer services to cover wide geographic areas was the major impetus to starting a franchisee network, Ruettgers admitted other factors were involved.

The shortage and high cost of field engineers was another reason the firm decided to go the franchise route. "We've had difficulty aligning the incentives an individual has with the incentives the company has," Ruettgers said. "If you have to pay field engineers a \$25,000 yearly salary plus overtime, the employee has no incentive to fix machines faster."

Because franchisees' field service personnel won't be on Raytheon's payroll, "they won't cause me to lose money. I won't have to worry about overtime or use of parts," he commented.

Indeed, under franchise law, Raytheon Service cannot be the sole source of parts to fill franchisees' requirements. Instead, Raytheon Service will make parts available to the network organizations on a competitive basis, Ruettgers said.

Depending on the success of the first two franchises, Raytheon Service will expand the network and its own service organization to cover the top 100 U.S. cities.

In addition, the firm will have to maintain its own service organization in the top 10 U.S. cities and some of the top 25, Ruettgers noted. Otherwise, "we would have no core of training, sales and technical support to provide to the franchisees."

## Group of Investors Acquires Datamedia

PENNSAUKEN, N. J. — Datamedia Corp. has been purchased by a group of investors headed by T.A. Associates, an affiliate of the brokerage firm of Tucker, Anthony & R.L. Day, Inc.

Major investors in the Datamedia purchase are FNCB Capital Corp., the Palmer Organization, Inco Securities Corp., First Capital Corp. of Boston and First Chicago Investment Corp. The purchase was for an undisclosed amount of cash.

In a related move, G.W. [Bill] Shipman, formerly director of minicomputer marketing for Honeywell, Inc., was named president and chief executive officer of the 10-year-old CRT manufacturer.

Kenneth Asquith, a founder and former president of the company, will serve as chairman of the board.

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# Cbema Fighting for Service Contract Act Relief

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Recently applied Department of Labor regulations may cost the computer maintenance and service industry as much as \$400 million the first year, according to DP industry spokesmen.

The Computer and Business Equipment Manufacturers Association (Cbema) said it will soon petition Congress for relief from provisions of the Service Contract Act which were extended to the DP services business June 8.

The 1965 law, amended in 1976 to include white-collar as well as blue-collar workers, was intended to protect the wages of those employed by government service contractors. The Labor Department expanded the law's coverage to federal contracts for DP and telecommunications maintenance despite Cbema's protests.

## Average Wage Becomes Minimum

Under the act, the Labor Department determines average wage scales for various service jobs in individual geographic areas. That average becomes the minimum wage that must be paid by companies seeking government service contracts in those areas.

Cbema contends the law was never meant to apply to relatively high-salaried workers such as computer service technicians and programmers. "The Service Contract Act originally was designed to shield low-pay service industry employees — like those in the custodial and food-handling trades who work under government contracts — from 'wage busting,'" Cbema President Vico Henriques said recently.

"Application of the act to this [DP] industry is a classic example of over-regulation," Henriques said. Unlike many services provided the government, federal computer services generally account for only about 10% of the contractors' business, he explained, claiming the law was aimed at federal contractors, not at primarily commercial vendors who happen to perform some work for the government.

According to figures supplied by Henriques, federal service contracts represent some \$3 billion to \$4 billion a year for Cbema's 36 member compa-

nies. The Service Contract Act regulations will affect some 100,000 employees in the industry who now earn average annual salaries exceeding \$20,000.

DP service firms that conform to Labor Department wage guidelines will have to discontinue merit wage scales, making them unable to compete in the commercial marketplace, which provides the bulk — as much as 90% — of their business, Henriques said.

Faced with this situation, affected firms will most likely stop bidding for federal contracts, according to Cbema officials, who say they know of at least two instances in which member companies dropped out of the bidding for government contracts when they could not get an exemption from the act.

Under the typical merit wage scheme,

about half a firm's employees earn less than the average wage for their position. According to the Cbema argument, if all the firms affected raised those employees to the average compensation level, it would cost about \$400 million.

In addition, because the remaining employees would be making more than the original average, the average pay level would rise every year, the association noted, leading to an ever-spiraling "inflationary pull."

## Cbema Backed by Brooks

Since last fall, Cbema has waged without success a broad campaign for exemption from the act. The association has, however, gained the support of Rep. Jack Brooks (D-Texas), the in-

fluential chairman of the House Government Operations Committee.

In a June 25 letter to the General Services Administration (GSA), which is charged with overseeing federal DP contracts, Brooks asked the agency to delay implementation of the Labor Department regulations until his committee can determine "if there will be an adverse impact on government operations from the applications of the act."

Henriques said his association is counting on the support of Brooks and the GSA when Cbema asks Congress for a legislatively mandated exemption from the Service Contract Act. Within the next few weeks, Cbema will present a proposal to the House Education and Labor Committee for relief from the act, Henriques said.

## Performance Price

### A special report on Minicomputers & Small Business Systems

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- How can minicomputers address inflationary problems?
- To what extent do existing personnel need to be retrained with the introduction of minicomputers?
- How can minicomputers make middle managers more effective in reaching corporate objectives?
- How does the introduction of minicomputers compel a need for restructuring data bases?

Edited by Brad Schultz this Special Report will feature a series of tutorials and application stories explaining how minicomputers and small business systems can best improve your productivity. Simply, getting more from what you've got. With our facts in your hands, you'll be better equipped to do just that — maximize the performance of your minicomputer.

We're going to blaze a trail for the minicomputer and small business system user so don't miss this *Computerworld* Special Report. And if you are a manufacturer or dealer in minicomputer equipment, you'll want your ad there. Closing date is August 10th. Call your *Computerworld* salesman for more information and complete assistance in ad planning. Or, to place an ad, call Frank Collins at (617) 965-5800.



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# Earnings Higher for Mainframers — Except IBM

While most mainframers tallied second-quarter revenue increases ranging from 15% to 19% more than last year's levels and even greater increases in earnings, IBM's second-quarter revenue grew by only 8.8% and earnings dropped 3.4% below last year's second-quarter results.

For its most recent quarter, IBM reported revenues of \$5.3 billion and earnings of \$667.4 million, or \$1.15 per share. The company's 1978 second-quarter revenues were \$4.9 billion and earnings were \$691.2 million or \$1.19 per share.

For the year to date, IBM's revenues grew 13.9%, reaching \$10.6 billion, compared with last year's half yearly revenues of \$9.3 billion.

Earnings for the first six months increased 4.2%, totaling \$1.3 billion or \$2.29 per share, up from 1978's six-month earnings performance of \$1.2 billion, or \$2.19 per share.

All per-share figures have been adjusted for the four-for-one stock split which was approved in May.

In explaining the company's earnings doldrums, IBM Chairman Frank T. Cary cited an increased demand for leased equipment vs. outright sales, inflationary pressures and the buildup in the company's resources to meet increased demand.

Moreover, Cary said the company is discussing the establishment of up to a \$1.5 billion credit line to cover the investment in resources and rental

equipment needed to meet the demand for the firm's products.

## Solid Jump for Burroughs

Burroughs Corp. posted a solid 16% revenue increase and a 20% earnings gain from last year's second-quarter

firm's total earnings of \$37.6 million. Last year, computer earnings represented only about 48% of second-quarter earnings of \$25.5 million.

Similarly, for the first six months of fiscal 1979, CDC's computer business contributed about 57% of total earn-

## Financial News

levels. Unlike IBM, Burroughs' revenue from outright sales vs. rentals and service grew by a wide margin. Revenues from sales increased 19% from last year's second quarter and rentals and services increased 11%.

By contrast, IBM posted a 9.7% boost in outright sales and an 8.3% increase in rentals and services from the comparable quarter a year ago.

For its latest quarter, Burroughs revenues were \$688.5 million, compared with \$593.7 million in the same quarter last year. Earnings advanced to \$68.9 million, or \$1.68 per share, compared with \$57.4 million, or \$1.41 per share, for last year's second quarter.

For the six-month period, Burroughs' revenues totaled \$1.27 billion compared with 1978's first-six-month revenues of \$1.09 billion. Earnings topped \$111.1 million, or \$2.71 per share, vs. 1978's six-month earnings of \$90.9 million, or \$2.23 per share.

Paul S. Mirabito, chairman, noted the second quarter was the first one in the company's history in which incoming orders exceeded \$1 billion.

## CDC Revenues Up 19%

Control Data Corp.'s revenues from its computer business reached \$536 million during the second quarter, up 19% from 1978's second-quarter postings of \$449 million.

Earnings from CDC's computer business jumped 92% during the quarter, reaching \$23.7 million vs. the \$12.3 million earned in the same period a year ago. For the quarter, computer earnings contributed about 63% of the

ings, vs. 41% in the first six months of last year.

For the year to date, computer revenues topped \$1 billion, compared with \$849.5 million for the first six months of 1978.

CDC's consolidated second-quarter revenues were \$772 million, compared with \$666 million a year ago. Consolidated earnings for the quarter reached \$37.6 million, or \$2.18 a share, up from earnings of \$25.5 million, or \$1.48 per share in the same quarter a year ago.

Six-month consolidated revenues topped \$1.4 billion, vs. \$1.2 billion last year. Earnings for the year to date are \$62.6 million, or \$3.63 per share, up from \$41.2 million, or \$2.38 per share, last year.

## Honeywell Posts 39% Gain

Honeywell, Inc. posted a 39% increase in income during its second quarter. Earnings reached \$61.3 million, or \$2.81 per share, compared with earnings of \$44 million, or \$2.06 per share, in 1978's second quarter.

Revenues totaled \$990.7 million, up from \$861.2 million in the same period a year ago.

For the first six months of 1979, Honeywell's revenues were \$1.9 billion, compared with \$1.6 billion a year ago.

Earnings for the first half were \$120.9 million, or \$5.56 per share, compared with 79.4 million, or \$3.72 per share, earned in the previous year.

Computer rental and service revenue for the quarter was \$172.5 million, including \$17.7 million in revenue from the international time-shared business, which became a joint venture with General Electric Co. last December. Rental and service income for the comparable period last year totaled \$171.3 million.

## NCR Report

NCR Corp.'s revenues from continuing operations reached \$717.5 million, up 17% from second-quarter 1978 revenues of just over \$614 million.

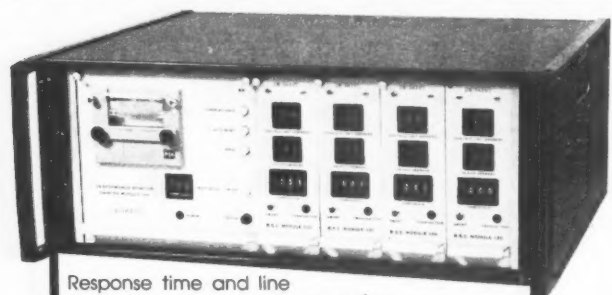
For the year to date, the Dayton, Ohio-based mainframer posted revenues of \$1.3 billion, vs. \$1.1 billion in the comparable quarter a year ago.

Earnings for the second quarter jumped 48% from 1978 levels, reaching \$58.9 million, or \$2.23 per share, up from earnings of \$39.8 million, or \$1.41 per share, in the same period a year ago.

For its first six months, NCR's earnings totaled \$89 million, or \$3.35 per share, compared with the \$56.7 million, or \$2.03 per share, earned in the first six months of fiscal 1979.

"Lower interest expense and higher interest income, reflecting a \$219 million reduction in long-term debt during 1978, have had a positive effect on earnings," William S. Anderson, NCR's chairman, said.

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## Court to Decide Fairness Of Viatron Settlements

(Continued from Page 61)

reduce its work force from 1,000 to 365 employees.

Attempting to raise cash, the firm discontinued its pivotal rental policy. Suddenly the \$39 terminal became a \$4,000 system.

Dealers, the key to Viatron's distribution mechanism, became disenchanted with the company. They now had to bear the brunt of the financial burden. Moreover, the dealers complained they could not get quick delivery of the product from Viatron.

Added to these problems was the fact that the dealers were selling to people who had never heard of distributed data entry. Bennett was forced to resign and a new management team took over. Despite reorganization, Viatron continued slipping, and finally in February 1971 filed a Chapter 11 bankruptcy.

At that time, the firm's assets totaled \$1.9 million and its liabilities \$24.8 million. In all, Viatron reportedly lost \$30 million in public investors' money.

Viatron continued to operate under Chapter 10 court-appointed management before finally fizzling out in the mid 1970s.

### Two Class Actions

Although investors recovered little if any of their investment directly from the Viatron bankruptcy settlement, two class action suits were filed against Viatron and the underwriters of the company's common stock and debenture issues.

Moreover, these class action suits seek to recover damages from Arthur Anderson & Co., Viatron's accountants, and from Arthur D. Little, Inc.

and various suppliers of MOS products to Viatron, according to an attorney involved in the voluminous litigation still surrounding the aftermath of Viatron.

David S. Stewart vs. Edward M. Bennett et al. was filed in December 1971 on behalf of purchasers of Viatron's 6.25% convertible subordinated debentures. Jules Sanders et al. vs. Edward M. Bennett et al. was commenced in February 1973 by holders of Viatron common stock.

In addition to these two suits, three other actions with similar charges are part of the package of suits pending against Viatron, its underwriters, accountants, consultants and suppliers. These suits charge that the defendants knowingly omitted facts and included misleading statements about Viatron's financial health and business operation in the prospectuses and registration statements required as part of a public offering.

Aside from the underwriters, the suits charge Arthur D. Little and various suppliers contacted by the underwriters in preparation for the public offering with not giving an accurate picture of the state of MOS technology, which resulted in misrepresentations of fact to potential investors.

These defendants, which vary in the individual cases, include Rockwell International Corp., American Microsystems, Inc., Motorola, Inc. and Hughes Aircraft Co. Unlike the underwriters, they have not proposed any settlement, and the remainder of the case should go to trial early next year, the attorney said.

## Executive Corner

- Alex Reid has been named vice-president of sales for The Braegen Corp.

- Richard M. Horowitz has been appointed vice-president of marketing and an officer of Aviv Corp.

- Herbert C. Kutzman and James F. MacKenzie have been promoted to vice-president of major account sales and vice-president of dealer sales, respectively, at Data Terminal Systems, Inc.

- Robert M. Marsh has been appointed president of Processor Technology Corp.

- Victor J. Goldberg has been elected a vice-president of communications at IBM.

- Joel T. Herbst has been appointed vice-president of marketing for Data-products New England, Inc., a division of Dataproducts Corp.

- Albert P. Weeks has been named director of information systems, Elmer J. Clegg, Jr. has been named regional director of federal government marketing and Mark I. Halpern has been added as manager of language development at Datapoint Corp.

- Harold Rosenberg has been elected president and chief executive officer of Codi Corp.

- Fred U. Odaka has been named vice-president of finance for Rexon Business Machines Corp.

- Frank T. Connors has been named senior vice-president of operations for

Northern Telecom Systems Corp.

- John A. Hill has been appointed president of TSD Display Products (Canada) by the board of directors of Megadata Corp.

- Bill Batchelor has been named national sales manager at Perkin-Elmer Corp.'s Memory Products Division.

- Scientific Timesharing Corp. has announced the election of five new vice-presidents and the realignment of company functions under five senior executives. The newly elected vice-presidents are John W. Myrna, vice-president of eastern U.S. marketing; Donald J. Soules, vice-president of management technology; John E. Suwara, vice-president of western U.S. marketing; and Roy A. Syles, vice-president of application development. Heading up the company's five major areas are Philip S. Abrams, vice-president of development; Robert E. Cook, vice-president of market development; Robert C. Fick, vice-president of finance; Patrick P. Gehl, executive vice-president of marketing; and Allen J. Rose, vice-president/technical director.

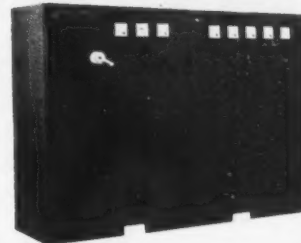
- Ralph A. Anavy has been named a vice-president of Gnostic Concepts, Inc. He will head the Econometric Services Division.

- D.J. Ekberg has been appointed vice-president of marketing by Data Card Corp.

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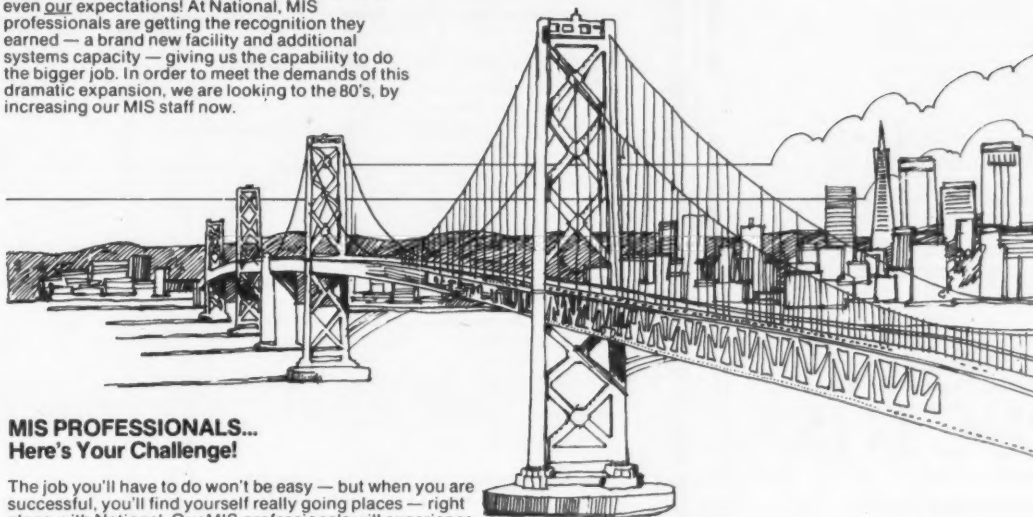
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A new position created to provide increased support for academic computing. A principal activity will be to work closely with various academic departments to develop computer programs for teaching and research. Requisites for the position include an ability to work closely with faculty and students, and experience in time-shared computing in BASIC, FORTRAN, or PASCAL. Applicants with an advanced degree and/or experience in applied statistics, quantitative methods in the social sciences, or simulation are most desirable. The College boasts a talented student body of 1850, a strong tradition of liberal arts education, and a beautiful rural setting. Send resume and 3 letters of recommendation to: Dr. James Krupp, Voter Hall Computer Center, Middlebury College, Middlebury, VT 05753. Deadline for completed applications is 31-Aug-79. Middlebury College is an equal opportunity employer.

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10 years exp. in systems engineering and software development. Software management exp. on DOD Projects and quality assurance exp. desired. MS or PhD preferred.

## 2) Programmer Analyst

Prepare initial schema and sub-schema layouts of database system. 6 years database exp. preferably in INFONET based MANAGE and ALADIN systems. BS or equiv.

## 3) Sr. Computer Scientists

Lead development of integrated database system. 10 years related exp., preferably in INFONET based MANAGE and ALADIN systems. BS or equiv.

## 4) Senior Engineer

Prepare hardware analysis and selection recommendations. Monitor subcontractor development. Develop acceptance test procedures. 4 years experience required. BS or equiv.

## 5) Computer Scientist

7 years related experience. Learn MANAGE DBMS to support SDL. BS or equiv.

## 6) Specialist

Technical Support Specialist. System configuration/design/manufacturing data. System logistics support (provisioning spares, O & M equipment/publications, training & transportation). 5 years in large electronic/sw. system co. BS or equiv.

## 7) Principal Engineer

Digital Engineer-computer/digital equipment and computer/software interface for complex ground system as SETA engineer. 5 years in real-time processing equipment. BSEE/MSEE or equiv.

## 8) Principal Engineer

Perform microwave antenna and RF front end engineering specification and analysis. 5 years in antenna/RF hardware. BSEE or equiv.

## 9) Senior Principal Engineer

System Engineer of large system involving antennas, RF, modems, processing, control S/W. 5-10 years experience on similar large systems. BSEE or equiv.

## 10) Member Tech. Staff

2-4 years experience with FORTRAN in real-time system operating on HP or other mini-computer. Degree preferred.

## 11) Computer Scientist

Experience in software design, implementation, testing integration and field checkout for HVAC and EMCS applications. BSEE or Comp. Sci. preferred.

## 12) Sr. Member Tech. Staff

Database, COBOL, and FORTRAN programming/analysis. BS/BA/MS preferred.

## 13) Programmer Analyst

2 years in design, development, test and implementation of management information systems. BS or equiv.

## 14) Programmer Analyst

Min. 4 years associated exp. Prefer exp. in process control, real-time FORTRAN computer hardware. Test, inspect, approve and modify real-time FORTRAN programs. BS/BA or equiv.

## 15) Member Tech. Staff

Minimum 1-2 years exp. with COBOL on UNIVAC 1108; financial background helpful. Degree preferred.

## 19) Associate Engineer

Energy Management systems engineering to include system/graphic layout and process control system

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## 20) Computer Scientist

Experience in software design, implementation, testing integration and field checkout for HVAC and EMCS applications.

## 21) Senior Engineers

Will prepare hardware analysis and selection recommendations, monitor subcontractor development, and develop acceptance test procedures. Four years experience desired.

## 22) Dept. Managers

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## 24) Hardware Monitoring Experimenters

Openings at intermediate and senior level for individuals to devise, set up, and conduct hardware monitoring experiments utilizing COMTEN (formerly COMRESS) equipment for the CCTC and other WWMCCS sites. These experiments normally measure computer performance of various components of a computer system. The senior post will include acting as a consultant to senior government personnel, to propose courses of action, and to assist in the preparation of "white" papers. Qualifications include background in the installation of COMTEN hardware monitors encompassing two or more years "hands-on" experience with D416, D7900, and D8000 monitors, familiarity with COMTEN's DYNAPAR data reduction software. Also, FORTRAN programming experience, a knowledge of gating (combinatorial) logic, and a general knowledge of simulation techniques, and software computer performance evaluation or measurement.

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**SYSTEM ENGINEERS** will participate in the specification of system architecture and translation of requirements into software specifications.

Considerations include data transmission, network maintenance and management, centralized billing and improved customer service. You will also participate on task teams with other GTE organizations to develop requirements and specifications, and to prepare design and implementation plans. Qualifications should include in-depth experience in communications system engineering. Telephony background is desirable. BS/MS in Engineering or Computer Science.

**SOFTWARE ENGINEERS** will be responsible for analysis, specification, design, development, test and maintenance of software involving man-machine interaction, communications processors, data base management, billing, switch maintenance and traffic data analysis. Requirements include several years experience in real-time software system development; assembly, PL-1, PASCAL, RSX-11 programming capabilities and BS/MS in Engineering or Computer Science. Experience in telephony, simulation, process control or related applications is desirable.

For further information call Fred B. Brown collect at (617) 890-9200 Ext. 621 or send a resume to him at: ATLANTIC OPERATION, Sylvania Technical Systems, Inc., 100 First Avenue, Waltham, MA 02154.

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## Bentley is looking for a few good people

### For Some Truly Great Jobs

We're looking for experienced, qualified computer personnel for our Information Systems Department. This department is recognized in academic and industrial circles as one of the finest and fastest growing in the area. We are converting from on-line time sharing to real time data base management systems for all administrative operations of the college.

Our standards are high and have a lot to offer the right people. In addition to competitive salaries and excellent fringe benefits, we offer free tuition for Bentley classes to upgrade your education while on the job. But perhaps more important is the unique change of pace Bentley offers from industrial anonymity. Our work hours can be made flexible to meet your needs.

As part of our team, your abilities are recognized individually. You'll enjoy being an important member of this prestigious group.

The following positions are now open in the Information Systems Department:

- **PROGRAMMER ANALYST** Responsibilities will include analysis, programming, documentation, and maintenance of administrative information systems. Candidates should have a minimum of 2 years experience in business-oriented programming. Knowledge of COBOL is required. Experience with DECsystem-10 is desirable.
- **SYSTEMS PROGRAMMER** Applicants should have a BS degree or equivalent experience and must have knowledge of DEC-10 macro assembly language and monitor internals. Experience with BASIC, FORTRAN, and COBOL is desirable.
- **DOCUMENTER** Will create and write user/operator manuals and department information releases; establish documentation standards. A BS/BA or equivalent in Business Communications, Journalism, or Computer Systems required. Business writing experience; some exposure to publications production and to programming is helpful.

Qualified applicants should send resume with salary history to: Bentley College, Information Systems Department, Beaver and Forest Streets, Waltham, MA 02154, Attn: Mr. R. Berger.

**Bentley College**



WALTHAM  
MA 02154  
(617) 891 2000

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### CENTRAL TEXAS LOCATION

## PROJECT LEADER

Experience the Excitement  
Of a career at CertainTeed

When you think "career", think CertainTeed, one of the fastest growing manufacturers of fiberglass insulation and building materials in the country. Because of our continuous expansion, we have a challenging opportunity for a Project Leader with 5-10 years computer systems experience including 3 years as a systems analyst. The successful candidate's experience should include financial and/or manufacturing/distribution applications. We prefer the individual who is familiar with IBM DOS/OS/VS systems and COBOL, and has project control skills.

You'll earn an excellent starting salary and benefits package.

Please send your resume and salary history to:



Peter Rittenhouse  
**CertainTeed Corp.**  
P.O. Box 889, Waco, TX 76703

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## Challenge, Excitement And Growth Opportunities With Turnkey Systems

We are a rapidly growing software products division of National CSS, a leader in the time-sharing/data processing service industry. Our dynamic expansion has created challenging assignments and rewarding career growth opportunities.

### Customer Service Representatives

Experienced systems programmers or analyst/programmers to provide installation assistance, education, and application design consultation to software product customers. Solid experience in IBM 360/370 assembler language. Needed all levels of experience. Openings in southern Connecticut, Chicago and San Francisco.

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Challenging positions helping customers diagnose software problems. Minimum 2 years experience with IBM operating systems and assembler language.

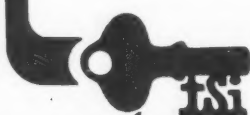
### Programmer

Software quality assurance department seeks experienced programmer who will be responsible for the development and implementation of internal systems and procedures for the integrity testing of software products. 2 years experience in assembler language, OS and DOS, JCL and utilities is preferred.

### Educational Service Representative

Qualified applicants must have 2 years experience in designing and implementing data processing applications to compile, structure and teach formal classes. Telecommunication experience helpful.

Turnkey Systems offer you an outstanding salary with an exceptional benefits package. Applicants are encouraged to apply immediately. Please submit resume specifying present salary to: Ruth Hensch



**Turnkey Systems Inc.**

50 Washington St.  
Norwalk, Connecticut 06854

turnkey systems inc.

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### LEAD

#### PROGRAMMER/ANALYST

Growing Research Center of a Fortune 500 company is seeking a creative individual with good organizational skills to be our Lead Programmer/Analyst. The successful candidate must have a B.S. degree in the Physical Sciences or Engineering and three to five years of experience in applications programming and systems design. Good knowledge of Cobol is essential.

We offer an excellent salary and benefits package. Interested applicants should send resumes in confidence to:

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1200 S. 47th Street  
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#### Senior Technical Managers

requires experience in financial system, IMS/VS DB/DC, TSO, distributed processing system, and 2 years in supervisor position. Salary to \$45,000.

#### Senior System Analysts

requires experience in financial or insurance area, IMS/VS DB/DC, specification writing, structure design and software testing. Salary to \$35,000.

#### Data Base Designers

requires extensive experience in IMS/VS DB/DC data base design, implementation. Salary to \$35,000.

#### Senior Programmers

requires extensive experience in IMS/VS DB/DC, TSO, COBOL programming, and development of data entry software for minicomputer. Salary to \$35,000.

United Systems Inc. is a young, growing consulting firm. We offer top salary, bonus, and equity to those qualified individuals. Please send your resume to United System Inc. 7315 Wisconsin Ave., Suite 727E, Bethesda, Md. 20014.

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HEB, employing over 10,000 people and rapidly expanding its success throughout South Texas, has immediate need on its staff for:

## SYSTEMS ANALYST

Ideal candidate has:

- 1 year experience in coding on IBM 360 or 370
- COBOL
- OS environment
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## SYSTEMS DESIGNER

Ideal candidate has:

- 2 years experience in systems development and data processing
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- college degree

We offer excellent compensation, benefits, paid relocation, and opportunity for career growth and accomplishment. Send resume to:

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WE HAVE dual 3033's, a great working environment, a convenient San Fernando Valley location (just 30 miles from Los Angeles, and 30 minutes from the ocean), excellent salaries & benefits, AND unlimited opportunity for professional advancement.

YOU HAVE experience in OS/MVS, worked with 360 or 370 IBM equipment and thorough knowledge of COBOL

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We currently seek:

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- System Engineers
- System Programmers

For immediate consideration send your detailed resume to:

Bob Bonney



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Design Microprocessor-Based Data System for A  
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- Operating system design
- Statistics and probability distributions

A BSCS degree or equivalent plus experience is needed. The prime assignment will be design and implementation of data storage and retrieval systems. In addition to attractive salary, benefits, and conditions, the position affords much room for contributions.

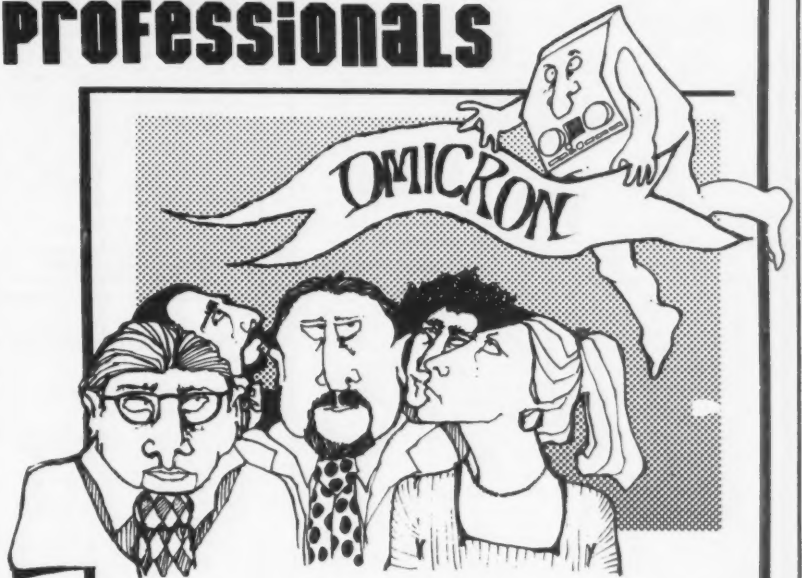
Please send resume, indicating salary record, in confidence to:



Personnel Dept  
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Our Consultants with extensive background in data processing can assist you in maximizing the full range of opportunities available in today's market place.

With offices in both Northern and Southern California, we keep tabs on the pulse of the industries where you're in demand.

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Consultants to the Computer Industry

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433 N. Camden Drive  
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## Programmers/ Analysts

NBC has several challenging opportunities for Programmers and Analysts with 1-5 years experience acquired in a large scale computer environment to join its team of professionals.

Qualified applicants should have a BA or BS Degree in addition to business applications experience in conjunction with a background in COBOL.

We offer an excellent benefits package and a salary commensurate with experience. For consideration, please send a complete and confidential resume to:

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Indiv's. trained in Group or Prop/Casualty systems can move into very visible and promotable positions. Positions in New England and Southeast. Salaries to \$30,000+. Contact Stan Durbas.

Robert Half of Hartford, Inc.



Agency  
111 Pearl Street  
Hartford, Conn. 06103  
(203) 278-7170

## DATA PROCESSING MANAGER

Seeking experienced D.P. Professional to manage and actively participate in systems and programming development projects, as well as supervision of operations procedures. Report directly to the Director of Management Information Systems. This is an excellent ground floor opportunity in a growth oriented environment.

Requirements: BS or BA in computer science, mathematics, business or related discipline. Systems programming experience on an IBM System 3 Model 150 using RPG II and CCP. Knowledge of data base management systems a plus.

Send professional resume and salary requirements in confidence to: (no third party responses please)

Mr. Victor Smolensky  
Director, Management Information Systems,  
Trans-Lux Corporation

110 Richards Avenue  
Norwalk, CT 06854  
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### Software Analysts, Digital Designers, Systems Engineers, RF Engineers

## Now combine the most important work of your career with country living.

Where? Join E-Systems Melpar Division just 10 miles from Washington, D.C., in beautiful, historic Fairfax County, Virginia. With E-Systems, you'll contribute to an organization that is well ahead of today's technology and is rapidly expanding for the future. You'll enjoy country living while working with nationally known scientific professionals. See if you are qualified to make this important move:

**SOFTWARE ANALYST** We are looking for people who have solid hands-on experience in assembly language. If qualified, you will be involved in software operating systems and special hardware interface. Ground-floor opportunities are now available that lead to rapid promotions to senior and lead positions for "take-charge" individuals.

**DIGITAL DESIGNERS** The designers we need must be innovative to meet the wide range of digital design and processing hardware our systems require, using advanced state-of-the-art devices developed by E-Systems with microprocessors/firmware.

**SYSTEMS ENGINEERS** If you feel you can now move up to system design and analysis yielding systems architectures and unit level specifications, we want to talk to you. Your responsibilities will be to define and coordinate functional, electrical and physical interfaces (including software) of sub-systems. You will also need the experience to participate in system integration and performance evaluation.

**RF ENGINEERS** We need experienced engineers who have creative ideas in the design of: Synthesizers/RF Amplifiers/IF Amplifiers/Mixers and Filters (IF/RF)

If you want to help us continue to make history in historic Fairfax County, send your resume with salary history to: Employment Manager, E-SYSTEMS, INC., Melpar Division, 7700-C Arlington Boulevard, Falls Church, VA 22046



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### COMPUTER CENTER DIRECTOR

New Mexico State University is seeking a Director of the Computer Center. The Director has the responsibility for planning and managing the University's Computer Center and reports directly to the Associate Academic Vice President. The Computer Center is responsible for providing high quality computer services to support academic instruction, academic research, and administrative data processing.

#### QUALIFICATIONS

1. Thorough knowledge of hardware and software computer technology.
  2. Commitment to university oriented user service.
  3. Academic background (Ph.D. preferred) and research experience.
  4. Demonstrated managerial capability.
  5. Planning and budgeting expertise.
- Salary is negotiable and applications will be accepted until October 15, 1979. \*NMASU is an Equal Opportunity/Affirmative Action Employer\*

Send resume or nominations to:

Dr. G.M. Flachs  
Search Committee Chairman  
Box 3-0  
New Mexico State University  
Las Cruces, New Mexico 88003  
Phone: 505-646-3301

### PROGRAMMER ANALYSTS (3 positions)

#### University of Administrative Information Systems

The Administrative Systems Development Unit of the SUNY/Albany Computing Center seeks three people to assist in the development and maintenance of a growing number of on-line, data base systems to support University administration and management decision making. Depending upon the skills and interests of the persons selected, specific assignments will be made to either our Data Base/Data Dictionary or Systems Maintenance/Enhancement project teams. Qualifications: Bachelor Degree plus 2 to 4 years of professional data processing experience or an equivalent combination of training and experience. Prior UNIVAC 1100 and/or University administrative systems experience will be given special consideration. Salary to \$18,400 depending upon candidate qualifications. Send resumes to Phil Semprevio, c/o Office of Personnel, SUNY at Albany, 1400 Washington Avenue, Albany, NY 12222. Applications deadline - August 6, 1979.

SUNY/Albany is an equal opportunity affirmative action employer. Applications from women, minorities and handicapped are especially welcome.

### PROGRAMMER/ANALYST:

282 bed hospital located in central Wyoming. We are seeking an individual with 3-4 years RPG II programming and 1-2 years CCP experience. Previous experience in hospitals or with the IBM S/3 15D preferred. We offer a competitive salary and excellent benefit package. Send resume including salary history and requirements to: Personnel Office, Memorial Hospital of Natrona County, 1233 East 2nd St., Casper, Wyo. 82601 or phone 307-577-2406. E.O.E.

Live in the High Country  
15 minutes to mountains  
Home of C.S.U.  
60 miles north of Denver

### COBOL PROGRAMMER / ANALYST

to work on DEC PDP-10 timesharing unit. A.A. degree in Computer Programming or closely related field and 1 yr programming experience. B.A. in MIS may substitute for experience. Beginning Range: \$13,744 - \$16,536 annually. Apply by August 10, 1979. Larimer County Personnel Office, P.O. Box 1190, Fort Collins, CO 80522. EOE.

### Senior Systems Analyst

New challenging position, take charge of developing a large comprehensive land use data base system for use by city of Salem, Marion County, Salem School District, and other Local Governments. The ideal candidate will have previous experience in land use data base, strong systems, programming, communication skills, CICS, DOS/VS Cobol, Assembler, and Data Base management. Distributed Processing is desirable. Current equipment is 370-138 - 1 MEG - DOS/VS, CICS, Cobol. New hardware currently under consideration. Excellent salary and fringe benefits. Apply Marion/Salem Data Center, 690 Ferry Street Southeast Salem Oregon 97301, 503-588-6344.

## COMPUTER PROFESSIONALS For A SUNBELT BANK

Our client, a quite progressive SUNBELT Bank, has engaged us to locate a number of career-minded computer professionals who are eager to develop an implement LEADING EDGE banking services through STATE-OF-THE-ART hardware and software.

Specifically our client is seeking:

### PROGRAMMERS SENIOR PROGRAMMERS PROGRAMMER/ANALYST SENIOR SYSTEMS ANALYST SENIOR ANALYST/ SYSTEMS PROGRAMMERS

Who Have Experience With:

IBM Systems 370-158, 168 and/or 3033

Hardware and Software Including:

IMS MVS, DB/DC, VSAM, VTAM, JCL, TSO, GIS, CPCS, TBOL, UTILITIES, ANS, COBOL, and Systems 370 ASSEMBLER.

For continued development of traditional Banking Services as well as on-line EFT Services such as POS, ATM and ON-LINE BRANCH BANKING.

Flexible time scheduling and CAREER PATHING have already been implemented for EDP professionals by client management.

If you are experienced in several of the above hardware/software areas and have interests in one of these opportunities please forward your resume with salary history to:

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830 E. Main Street  
Suite 591- Sunbelt  
Richmond, Va. 23219

Equal Opportunity Employer

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### IN COMPUTER BASED EDUCATION WITH CONTROL DATA CORPORATION

Control Data Corporation is dedicated to more effective learning and information dissemination. We are achieving this goal through our international computer based education system - PLATO. If you are interested in joining this challenging effort, we have the following position available at nationwide locations.

### INSTRUCTIONAL DESIGNER DATA PROCESSING COMPUTER SCIENCE COURSES

Be responsible for analyzing customer training needs and specifying appropriate instructional products. Applicant should have demonstrated familiarity with the subject matter and possess team leadership skills. 2 years experience in any three of the following areas are required: Industrial/vocational education; college university teaching and course development; instructional technology; PLATO computer based education; and/or individualized instruction.

We offer excellent incomes commensurate with your experience, plus generous benefits and outstanding opportunities for professional growth.

If you would like more information on these immediate opportunities or others with Control Data Corporation, please call collect or send your resume in confidence to:

Patricia Roberts  
Control Data Corporation  
P.O. Box 0 HQA02G  
Minneapolis, Minnesota 55440  
(612) 853-5653



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## LEAD ADMINISTRATIVE PROGRAMMER/ANALYST

To head conversion, development and maintenance of college's administrative application. Reports to Director, Computer Services. Journeyman COBOL Programmer/Analyst with 1 or more years of project leadership and supervisory duties and telecommunications and data base experience. Prefer experience in conversion, higher education application, and degree in appropriate discipline. Equipment is Burroughs B4720, with upgrade to large system in works.

Four year liberal arts college of 6,200 students is located in Northern Catskills of central New York. Varied cultural, recreational attractions close by.

Rank and salary negotiable based upon experience and abilities. SUNY offers a range of liberal benefits.

Send letter application, resume and salary history by August 6, to:

Mr. Charles R. Weber, Director of Personnel

### State University College

Oneonta, New York 13820

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### FLORIDA

### CICS SYSTEMS PROGRAMMER

LEADING DATA PROCESSING COMMUNICATION and PERIPHERAL MANUFACTURER located in the SUNSHINE STATE is looking for TALENTED CICS INTERNALS SPECIALIST. Experience in the areas of CICS INTERNALS using ASSEMBLER language on LARGE SCALE IBM 370 OPERATING SYSTEMS IS DESIRABLE. Please submit RESUME including SALARY HISTORY or CALL:

FRANK LEONARD PERSONNEL  
1211 North Westshore Boulevard Suite 100  
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813-872-1853

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## IMS Programmer/ Analysts \$18 to \$28K San Francisco

Several of our Bay Area clients have immediate openings for IMS Programmer Analysts. Positions require a minimum of 2 years in Data Processing with 1 year in IMS COBOL applications. Prefer Manufacturing, Finance or Distribution Applications. Positions include relocation and excellent benefit packages. We are consultants to management. Please send resume and salary history in confidence, to Gary R. Schultz, One Maritime Plaza, Suite 1350, San Francisco, California 94111, (415) 956-7126. Employer assumes fee.

**professionals  
for computing, inc.**

## PROGRAMMER/ ANALYST

Growing supermarket chain in expanding data processing department. Successful candidacy requires command of COBOL and at least one other programming language. Experience in DOS and teleprocessing is required. Experience with data base and accounting applications is desirable. Competitive salary and benefits. Advancement potential. Send resume to:

Director of Personnel  
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## PROGRAMMERS

1. Leeds & Northrup is the leading company in the computerized process control field, so naturally we can offer more in the way of a high technological environment, opportunities for growth, and broader areas of personal and professional involvement.
2. Leeds & Northrup is known throughout the industry for its quality, professionalism, state-of-the-art technology, and for the excellence and dedication of its people. We are among the first to apply the latest advances in technology, and are constantly creating innovative systems and programs of our own design and engineering.
3. As an L&N software professional, you will be an important member of a project team working on long-term assignments. Your skills and knowledge will be greatly enhanced by interfacing with specialists from a wide variety of computer science and engineering disciplines.
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6. The salaries and benefits we offer equal or exceed any in the industry. But we don't stop there. We have a special Short Cycle Evaluation Program that assures you of performance and salary reviews several times a year...and the visibility and recognition that go with them.
7. Our location is another feature of Leeds & Northrup that you'll be interested in. We are in a beautiful suburb of Philadelphia that offers excellent housing, public schools, and universities, and is within an easy drive of the cultural centers of Philadelphia and the mountains and seashore.

PUT THE L&N DIFFERENCES TO WORK FOR YOU IN YOUR CAREER IN THE FOLLOWING AREAS. BEGIN BY SENDING YOUR RESUME TO OR CALLING: JIM HENDERSON, (215) 643-2000, EXT. 2010, SYSTEMS GROUP, DEPT. C-7/30, LEEDS & NORTHRUP, DICKERSON ROAD, NORTH WALES, PA 19454.

## SCIENTIFIC PROGRAMMERS SOFTWARE MANAGERS

Typical assignments will involve:

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Design and integration of operating systems and software development

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CRT graphics, loggers, operator's panels

### APPLICATIONS

Electric power applications, both systems control and plant performance monitoring; Waste Water, CPI and other industrial applications

### COMMUNICATION

Data acquisition, control output, computer-computer communications

### SUPPORT PROGRAMS

Data base generators, display compilers, source editors, general utilities

Preferred backgrounds will include a B.S. degree in Engineering, Mathematics, Physics, or Computer Science and 2-5 years of hands-on related experience, with at least one year of FORTRAN in a scientific programming environment. Electric power experience in supervisory control, data acquisition, or automatic generation control is an asset, as is a knowledge of ASSEMBLY.

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environment**

## HEATHKIT SOFTWARE DOCUMENTATION WRITER

At Heath Company quality documentation is an integral part of the final product. Since Heath is expanding in the computer products area, writers are needed to continue the Heath traditions in the software documentation areas.

We are seeking applicants with:

- An enthusiasm for personal computing.
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- A degree is preferred, but does not have to be in computer science.
- Also, approximately one semester of BASIC or any other program language plus exposure to business applications of computers.

or

Approximately four semesters of programming experience, including BASIC, one other high level language (preferably Pascal), and the equivalent of one semester of assembly language.

Heath offers an attractive benefit package, competitive salaries, and a pleasant life style in a smaller community with outstanding recreational facilities on the shores of Lake Michigan.

Please send resumes and salary requirements in confidence to:

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(616) 982-3673

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## DATA PROCESSING MANAGER

Immediate opening for "heavyweight" with MIS for growing electronics company in West Palm Beach, Fla. area. Requirements include strong background with on-line environment.

Excellent opportunity including open salary plus override and regular company benefits.

For further information, write in confidence to:

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Tel: 305/848-4311

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IF YOUR SALARY DOLLARS ARE NOT KEEPING PACE WITH RISING COSTS-OF-LIVING, IF YOU ARE WORTH MORE MONEY THAN YOU ARE NOW EARNING, OR IF YOU ARE READY FOR A CHANGE AND WANT YOUR JOB SEARCH HANDLED BY PROFESSIONALS, SEND US YOUR RESUME FOR COMPLETE COVERAGE OF THE NATIONAL EDP JOB MARKET. (CLIENT COMPANIES PAY ALL FEES)

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## DATA PROCESSING PROFESSIONALS City of Hartford

### Senior Systems Analyst

Salary to \$21,463

Originates, installs or modifies major operating municipal systems. Preferred person with at least three years of systems analysis of commercial applications. Financial systems experience helpful.

### Computer Programmer

Salary to \$18,200

Preferred person with two years of data processing related college courses with at least two years of complex programming in commercial applications. Submit detailed resume to the Personnel Department, City of Hartford, 550 Main Street, Hartford, CT 06183

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## IMS DATA BASE ADMINISTRATOR SYSTEMS ANALYST SYSTEMS PROGRAMMER

Hobart Corporation, a leader in the manufacturing of commercial food equipment and kitchen appliances with World Headquarters in Troy, Ohio is seeking professionals for the following openings:

- **IMS DATA BASE ADMINISTRATOR** — 5 to 7 years DBA experience with IMS DB/DC under OS/VS, or MVS. IMS DD/D experience is desirable. Experience must include all technical disciplines as well as overall corporate data management planning and administration expertise. Our MIS Department is initiating the implementation of IMS DB/DC 1.1.5 and DB/DC dictionary 3.0. The administrator will be the focal point of the installation, implementation, and utilization of our DBMS and the DD/D environments as well as being an integral member of the Systems Assurance Department.
- **SYSTEMS PROGRAMMER** — 1 to 3 years systems programming on IBM MVS systems.
- **SYSTEMS ANALYST** — 4 to 7 years experience with financial/marketing systems with strong background in business analysis and systems design. IMS data base, order entry, on-line, distributed processing background desirable.
- **PROGRAMMER** — Experience with COBOL, assembler, CICS, OS/MVS, JCL.

If you qualify and are interested in joining an aggressive implementation and support team, send your resume and salary history or call 513-335-7171, ext. 2212.

**James L. Severs**  
Manager, Staffing and Development

**HOBART**  
CORPORATION

WORLD HEADQUARTERS  
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## Computer Pros. Move to the top of the hill.

The Government Electronic Systems Division of the Harris Corporation is currently looking for experienced **SYSTEM-LEVEL PROGRAMMERS** for assignment in the suburban Washington, D.C. area. The ideal candidate will have 1 to 5 years of **FORTRAN** or **ASSEMBLY** experience on the following systems:

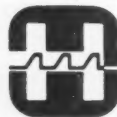
**UNIVAC 1108**

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Harris provides an excellent starting salary, benefit package, an outstanding relocation policy, and the opportunity to advance professionally.

For immediate consideration, send your resume in confidence to:

Don Ellison, Harris Corporation,  
Government Electronic Systems  
Division, P. O. Box 37 CW, Melbourne,  
Florida 32901.



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COMMUNICATION AND  
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Programmers/Analysts

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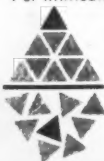
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- Assessing the design and predicting the performance of special purpose computer systems, and analyzing the overall performance of complex systems that contain computers as integral subsystems. Applicants for these positions must be knowledgeable in Operations Research techniques, computer operating systems, and discrete-event simulation languages.

Salaries range from \$15,000 to \$30,750 with excellent opportunity for management responsibility. Advanced degree desired. Send resume of qualifications and salary history to:

Dept. of the Air Force  
FEDISM/CC  
Washington, D.C. 20330

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National Trade Association headquartered in San Francisco Bay area seeks a Vice President for membership and member services. Organization has several chapters and two regional offices; staff about 35; budget well over \$2 million. Successful candidate will have strong administrative and marketing sales background with association experience, particularly in selling memberships. Knowledge of Electronics Industry a big plus. This is an outstanding opportunity since there is a clear prospect for promotion, increased responsibility and substantial salary increases in foreseeable future for the right person. Starting salary about \$60K, plus benefits. Send resume and salary history to:

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Manage a group of systems analysts in designing and developing computer software systems for banks. Responsible for delegation of work, determining time frames, schedules, consult directly with banks. Follow up on quality of work. On-site visits to banks. Must be familiar with banking procedures, have 3 months training in Computer Software and Hardware plus 3 years experience, or 3 years related experience in managing the integration and implementation of computer systems into Financial Institutions. \$18,000 per year, plus bonus incentive plan valued at \$6000 annually, 40 hours per week. ANACOMP, Inc., 1390 Main Street, Sarasota, Florida 33577. (813) 366-2600.

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The Administrative Services Dept. of the Fordham University Computer Center requires exp'd personnel to provide design & programming support for several applications including student records & financial systems. The successful candidate will have appropriate experience including several yrs COBOL programming. We currently utilize a DECsystem-20 with on-line data base and interactive query capability to satisfy administrative information requirements.

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FORDHAM UNIVERSITY  
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## University of Petroleum and Minerals Dhahran, Saudi Arabia

Department of Systems Engineering

The Department of Systems Engineering, University of Petroleum and Minerals, Dhahran, Saudi Arabia, will have faculty positions open for the academic year 1980-81, starting 01 September 1980. Candidates with PhD Degrees in Systems Engineering with emphasis on Large Scale Systems, Automation, Operations Research, Simulation and Digital Systems, preferably with teaching experience are invited to submit their applications.

Minimum regular contract for two years, renewable. Competitive salaries and allowances, air conditioned and furnished housing provided. Free air transportation to and from Dhahran each two-year tour. Attractive educational assistance grants for school-age dependent children. All earned income without Saudi taxes. Ten months duty each year with two months vacation paid and possibility of participation in University's ongoing Summer Program with good additional compensation.

Apply with complete resume on academic and professional background, list of references, a complete list of publications with clear indication of those papers published in refereed professional journals, research details, and with copies of transcripts, degrees, including personal data such as family status (spouse's name, names of children, ages and sexes) home and office addresses, telephone numbers to:

University of Petroleum and Minerals  
2223 West Loop South, Suite 410  
Houston, Texas 77027

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### LEAD DIAGNOSTIC ENGINEER

Qualified candidate will lead and coordinate project activity during the planning and development of test software packages for microprocessor based systems. Must be experienced in diagnostic development and test including design of test plans involving malfunction simulation and simulation support software. BSEE or BSCS required, MSEE or MSCS preferred.

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### Have you ever Thought of San Francisco?

If so, then join us at Tymshare Transaction Services. We are a fast growing company seeking individuals interested in participating in this growth. The organization is entering a distributed environment including remote processing centers with telecommunication networking and distributed data entry in a rapidly expanding financial market.

#### Programmer Analyst

Positions require experience in a commercial environment with a minimum of 2-3 years' COBOL and/or ALC on-line applications desirable.

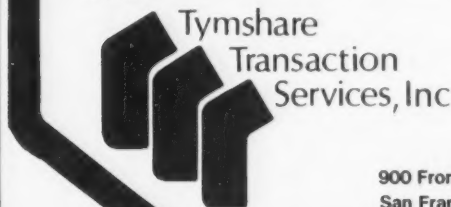
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Requires a minimum of 3 years' senior level EDP auditing experience. A bachelor's degree in computer science, business administration, or accounting is highly desirable. Positions offers opportunity to maintain a (state-of-the-art) level in EDP auditing.

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Requires minimum of one year's experience on IBM 370/158 or larger with any of the following operating systems: OS/VS1, OS/VS2, MVS, or VM in a heavy teleprocessing environment.

Equipment configuration features an Amdahl V6 and dual 370/158's running under MVS program development using TSO and SPF. The company offers excellent starting salaries, top benefits, and an environment conducive to development and participation. Relocation assistance is provided. Please send resume or letter of interest to Duff Wentz:



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**SYSTEMS - ANALYST** (\$13,111 - \$19,781/yr) Bachelor's Degree in Business or Computer Science with five years experience, preferably in higher education. Duties include analyzing and developing applications for a wide variety of business and educational uses. Must possess ability to communicate with computer systems practitioners and lay users.

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**COLORADO OPENING!****SENIOR PROGRAMMER/ANALYST**

An immediate opening now exists at the Henderson Mine for a Senior Programmer/Analyst. We operate on an IBM 370-148, 2-MEG running VM. If your background includes DOS/VS, ANS COBOL, and VSAM and 3-5 years general data processing experience, we wish to speak to you about our current opportunity. Henderson Mine is located in the center of mountain recreational activities within commuting distance of Denver. Car pooling is available.

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Or call (201) 668-3040

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Rapidly growing electric utility has an opening for a programmer with a thorough knowledge of all facets of data processing. Bachelor's degree in computer science or business administration preferred plus two years progressively responsible experience. Should have working knowledge of general accounting, billing and engineering procedures. Forward resume and salary requirements to:

Personnel Dept.

Lee County Electric Co-op

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in Related Field

Minimum 2 Years of Experience

Transcript + 3 Letters of Reference

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Salary Mid to Upper Teens + Excellent Benefits

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Dir. of Admin. Data Processing

Room 204, Administration Bldg.

State University College

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Letters of application, resumes, and references should be sent to:

Director of Business Affairs

Harris-Stowe State College

3626 Laclede Avenue

St. Louis, Missouri 63103

Applications must be postmarked no later than Monday, August 6, 1979.

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The candidates we seek must have at least three of the following experience factors:

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We are a division of a top Fortune 100 major electronics corporation developing and manufacturing data communications and microcomputer products and systems. We are expanding rapidly to include the development, manufacture, and marketing of a "next generation" line of word processing systems. We are seeking an experienced word processing systems manager to specify, develop and introduce word processing products. Reporting to the Director of Engineering your responsibilities will include product formulation and direction of a new engineering team through all phases of system development beginning with problem definition through to customer installation.

This product will involve intelligent microprocessor based terminals and controllers used for word processing, communications, and data entry. Must have BSEE or applicable degree plus 8 or more years broad background experience in technical/managerial functions related to design and development of high technology programs including word processing systems.

Salary will be fully commensurate with qualifications. We are located in a notably attractive sunbelt city in the southeast. Our area offers a variety of lifestyles and enviable cost-of-living advantages. All inquiries will be regarded in strictest confidence. Please send resume and salary history to:

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Due to the small size of the group, individual must be able to handle all aspects of a systems job with minimal supervision and project specifications. Good written and oral communications skills, both on a technical and non-technical level, are essential.

Qualified candidate must have at least one year's recent experience on a time-sharing system (preferably IDC) and a B.A. or B.S. in Computer Sciences, Management Information Systems, or Mathematics. Graduate work in Computer Sciences (or towards an M.B.A.) desirable, but two years FORTRAN work experience or its academic equivalent will suffice.

This is a highly challenging position with impressive opportunities for professional development and career advancement. Qualified applicants should submit resume with salary history and requirements to:

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## SENIOR ANALYST/PROGRAMMER

A position exists in our MIS Department, located at Headquarters in suburban Cleveland, Ohio. Required is a BS or BA degree with 4-6 years experience in ANS COBOL and MVS JCL. IDMS data base capability is preferred. You will have the opportunity to work with an IBM 3032 system in a mature, aggressive, stable organization staffed with world class personnel. This position offers an excellent starting salary, attractive benefits and advancement opportunities based on professional performance.

Please send resume to Georgia Marech, Employee Relations Department.

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Position requires OS & MVS background with Sysgen experience. You will be working with CICS, ROSCOE, AND SHADOW II. Programming experience with ANS COBOL needed.

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Two to three years ANS COBOL programming experience required. Life insurance background helpful but not necessary.

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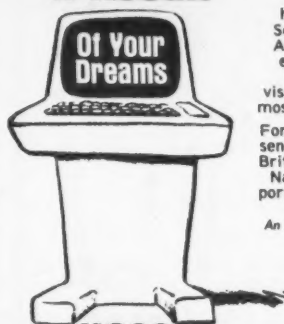
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## SYSTEMS PROGRAMMERS

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For immediate consideration, send your resume to: Richard Brittain, Corporate Recruiter, National CSS, Inc., 542 Westport Ave., Norwalk, CT 06851.

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Data Center Manager

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## ARE YOU LOOKING FOR A SOFTWARE CAREER THAT HAS CHALLENGE OPPORTUNITY DIVERSITY Mini/Micro Computer

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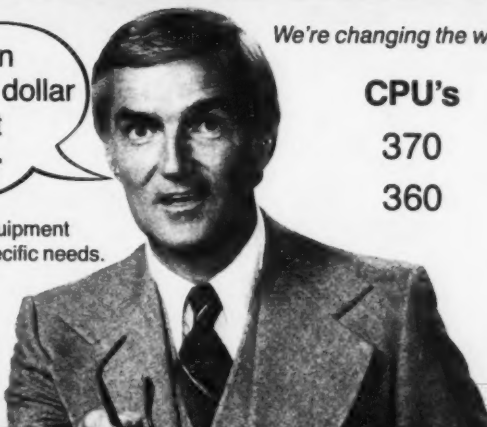
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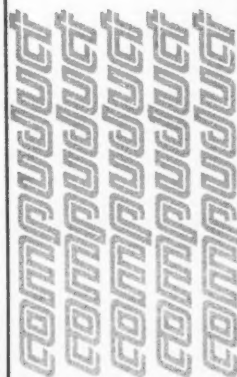
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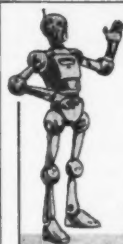
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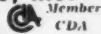


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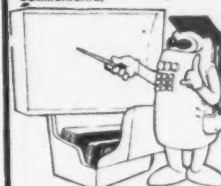
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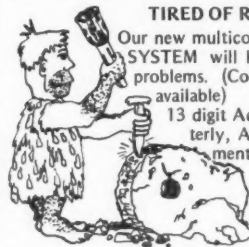
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